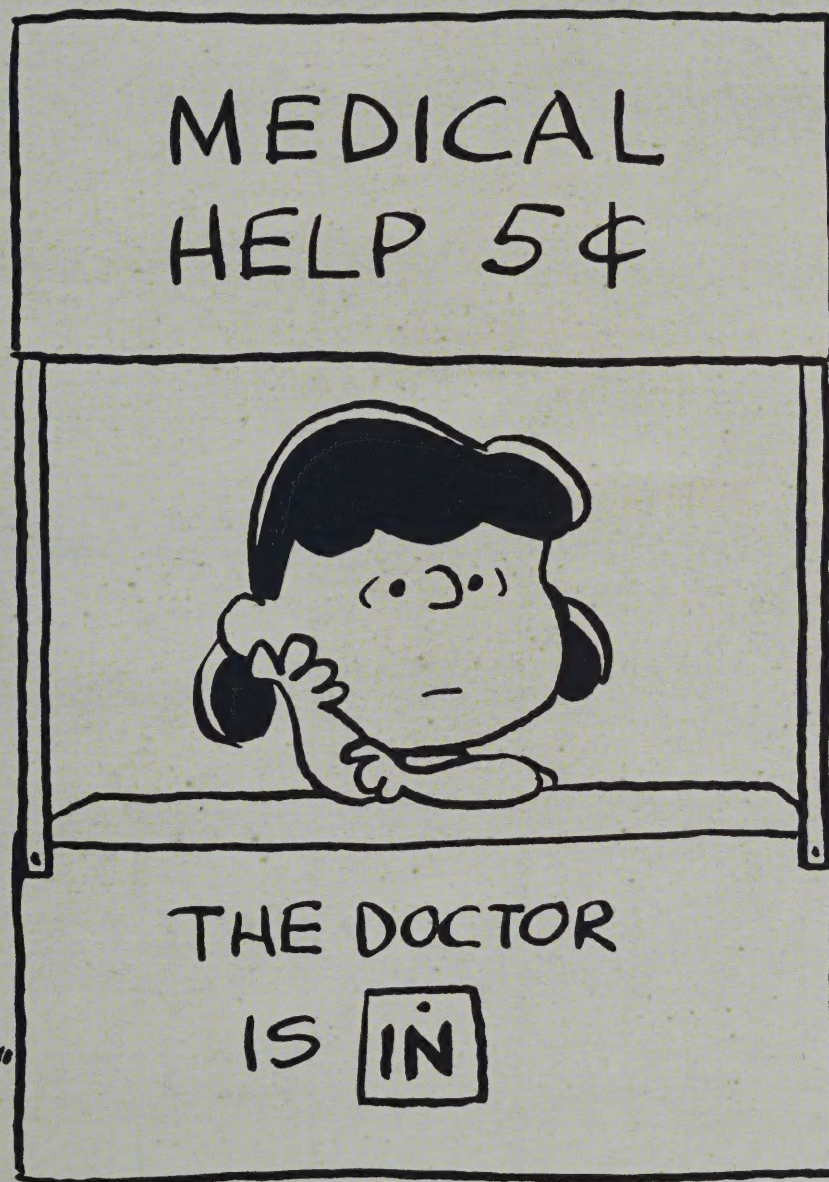


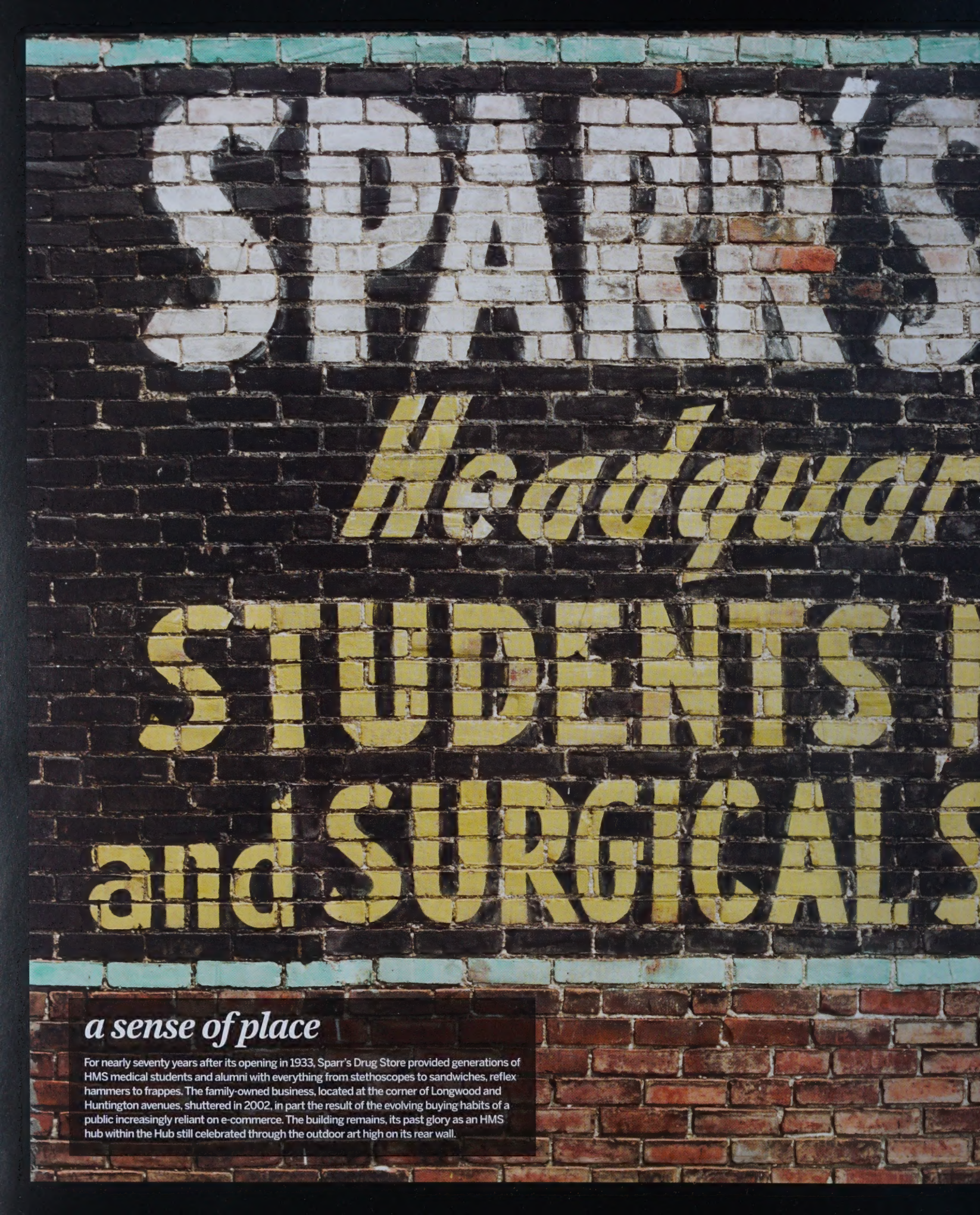
HARVARD medicine

AUTUMN 2019



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The Business of Medicine



SPARR'S HOSPITAL STUDENTS and SURGICALS

a sense of place

For nearly seventy years after its opening in 1933, Sparr's Drug Store provided generations of HMS medical students and alumni with everything from stethoscopes to sandwiches, reflex hammers to frappes. The family-owned business, located at the corner of Longwood and Huntington avenues, shuttered in 2002, in part the result of the evolving buying habits of a public increasingly reliant on e-commerce. The building remains, its past glory as an HMS hub within the Hub still celebrated through the outdoor art high on its rear wall.

ers for
MEDICAL
SUPPLIES



WELLS STONE



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THAT PERSONAL TOUCH: A number of physicians are developing new models for the delivery of primary care. Some, like alumna Tonya McDonald, have established independent concierge practices that include the iconic home visit.

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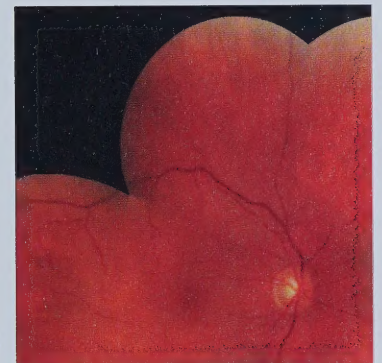
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JOSH PHILLIPS

The Importance of Being Responsive to Change



HEALTH CARE IS FACING MANY CHALLENGES, from controlling costs to cutting waste and errors to being more responsive to the needs of patients.

The importance of overhauling the “business of medicine” has been a subject of scrutiny by many, including researchers in our Center for Primary Care. For nearly a decade, the center’s scientists have focused not only on ways to improve the delivery of care but also on how to better listen to medicine’s “customers”—its patients.

For example, in April 2018, Lindsay Hunt, director of health systems transformation at the center, and Andrew Ellner, MD ’02, director of our Program in Global Primary Care and Social Change, published in *NEJM Catalyst*, an online forum for thought leaders, the results of a four-year initiative, the Academic Innovations Collaborative, conducted within residency training practices and community health centers affiliated with HMS.

From their analysis of the findings from this “learning intervention,” Hunt and Ellner identified five areas that were key to transforming primary care: using evidence-based change concepts and tools, fostering strong relationships within and across practices, instituting a simple system for reflection and feedback, building in structured time for team discussion and planning, and ensuring regular and meaningful engagement of leaders. Clinical practices that adopt and adapt these principles, the authors say, will have a better chance of thriving in the face of changes likely in the years ahead.

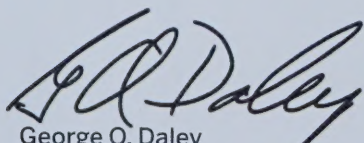
A separate study that Ellner published in 2017 in the *Journal of General Internal Medicine* with Russell Phillips, director of our primary care center, reported that if primary care is to be responsive to the needs of future practitioners and patients it must emphasize approaches that foster teamwork, expand the use of technology, and focus on providing care to the whole person.

At HMS, this vision has long been our reality. Our medical students are trained to lead and collaborate, to conduct research using original and evidence-based approaches, to implement best practices, and to change how care is delivered through teamwork and entrepreneurial efforts. Our students innovate, create, and question.

Harvard Medical School is a complex, global enterprise. It is an incubator for novel therapeutics, a launching pad for start-ups, a think tank for policy breakthroughs, a training ground for biomedical researchers, and perhaps most important, a nexus for thoughtful, evidence-based innovation in the **delivery** of health care.

We graduate doctors who go into the profession and effect change—the type of change that will keep our “business” running for centuries to come.

Harvard Medical School is a nexus for thoughtful, evidence-based innovation in the delivery of health care.


George Q. Daley
Dean of Harvard Medical School

HARVARD medicine

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Time Stamp

I RECENTLY ATTENDED my fortieth reunion. All of us in the Class of 1979 have aged, but few of us have changed fundamentally. Collectively, we represent a time in medicine when the inherent purpose of health care was straightforward and its delivery was firmly rooted in patient contact. In the decades since we graduated, medicine has become an enormous industry with a clear shift of focus from healing to profit, and the professional lives of many of us have likewise shifted from patient-centric processes to technology-driven systems lacking the grace, humanity, and ethics of our medical school training.

Out of a class of about 165 individuals, 62 came to the gathering. Ten of my classmates have died. So, 40 percent of our remaining class attended this reunion. Most of us continue to practice medicine, and many of us (myself included) are clinicians who have dedicated their careers and a major portion of their lives to patient care. A large set works in some capacity in industry or health care administration. Others are actively involved in basic or clinical research. Another subset has a professional focus that overlaps more than one of these categories: academic practice, private practice, government, or the pharmaceutical industry.

But we all share a common denominator forged by a combination of the selection process for medical school in the mid-1970s and the experiences of our congruent medical education. During our time at HMS, the Class of 1979 formed very lasting bonds. These bonds derived from comparable, intense preclinical and clinical experiences among a group of highly motivated individuals who had an ardent desire to improve health care delivery in some intangible manner years ago in pre-Big Dig Boston. A major ingredient of this communal drive to change the world for the better, one patient at a time, was an unbridled optimism, a sense that—with sufficient dedication of energy and resources—everything in medicine was possible.

Although none of us at the reunion looked the same as we did four decades

“These bonds derived from experiences among individuals who had an ardent desire to improve health care delivery.”

ago—it was definitely necessary to read the nametags before addressing someone by the wrong name—if you closed your eyes and listened, you could easily identify people. Likewise, mannerisms have not changed much, if at all. Facial expressions, the way individuals laugh, the syntax of their speech, and the cadence of their voices are much like fingerprints and bring with them a cascade of remembrances, includ-



Aerial photo of Boston, Allston, and Cambridge, Massachusetts, circa 1979

“Many of us are left fighting what are retreating skirmishes and losing battles to maintain an increasingly untenable standard of care.”

ing musical numbers from our Second Year Show, “Cramalot.”

However, while most—if not all of us—have retained an unwavering dedication to patient care, the world of medicine has clearly moved on, and not just technologically. Listening to many conversations over the several days of reunion, it became clear that this transition has radically reshaped two fundamental elements of health care delivery that we learned and held sacrosanct during the formative years of our training: the critical importance of direct patient interaction as inviolate for diagnosis and planning treatment, and a near-religious belief that excellent patient outcomes were the primary, secondary, tertiary, and quaternary reasons for our work, and the only cogent justification for the sweat, stress, angst, and excitement that saturated our lives during medical school.

Although the art of taking a history and performing a physical exam are still taught in medical school, in practice these tasks are increasingly relegated to nonphysicians in part or entirely. This change has been driven both by the need to “see” large numbers of patients in a comparatively short time and by the access, ease, and monetary reward associated with labs and scans. Often, the first steps of a diagnostic workup within the framework of today’s health care-industrial complex

involve a relatively undirected battery of blood work and radiologic interventions.

Fresh out of medical school, during my internship in the winter of 1979, I saw a 21-year-old Marine veteran with chest pain. After taking a detailed history, I palpated his peripheral pulses and determined that his right carotid pulsation was diminished compared with his left. No technology was involved. The same exam could have been performed at his home, in a shopping center, or on board an airplane at 35,000 feet. Predicated on this exam and an understanding of the possible implications of chest pain in a young, otherwise healthy, patient, I ordered a two-dimensional transthoracic echocardiogram, a relatively new test at that time. The study revealed an ascending aortic dissection involving the right common carotid artery. In recent years, it has become increasingly rare for physicians, with the exception of vascular surgeons, to examine patients’ pulses in their entirety, or to have the clinical ability to detect subtle changes in those pulses, and it is unusual for physicians to allot (or to be allotted) sufficient time for optimal patient contact.

Precisely why the medical world has deviated from its course so abruptly is not entirely clear. Certainly, part of the answer is greed, combined with the realization that the industry of medicine represents an unsurpassed


opportunity to generate profit from an aging population that is increasingly focused on aspects of well-being and longevity. It is also possible that part of the reason for this change in health care focus relates to the general decline of ethics in modern America.

Regardless of the reason, as I glanced around the room at my reunion colleagues, it was clear to me that we are dinosaurs. We were shaped in a professional mold that was intimately linked to direct patient contact and motivated and driven by a desire to maximize the quality of our patients’ health. Many of us are left fighting what are retreating skirmishes and losing battles to maintain an increasingly untenable standard of care. But much as the destruction of Arthur’s Camelot did not undermine the ultimate worth or meaning of the Round Table, so the passing of our era of health care will not diminish its essential value: that medicine grounded in direct patient contact is critical and that the essence of good medicine is defined by quality patient outcomes.

Camelot’s Round Table was a powerful symbol that all seated individuals were important, not just the king, who traditionally sat at the head of the table. The concepts of equality and the importance of the individual are fundamental to the theme of democracy, an ideal that has undergone a degree of remodeling over time but whose core remains largely unchanged. In the same way, future generations of physicians may look back upon our class as an example of a valuable endeavor that thrived for a fleeting interval of time.

It is our collective hope that such remembrances positively influence future course corrections in health care. In the interim, many members of the Class of 1979 likely will continue to passionately advocate for and practice patient-centric health care with the hope that our struggles may not be entirely in vain.

BARRY SWERDLOW, MD '79
MALIBU, CALIFORNIA



Step Back

IS TAKING 10,000 STEPS DAILY the key to better health and longevity? Maybe not, say HMS researchers at Brigham and Women's Hospital. An observational study over four years of more than 16,000 women, average age of 72, found that those who walked least—2,700 steps on average daily—had the greatest mortality rate, while those who achieved 4,400 steps daily had a 41 percent decrease. Mortality rates continued to decrease with more steps taken, before leveling off at 7,500.

Lee IM, et al. *JAMA Internal Medicine*, May 2019

IMMUNOLOGY

Maternal immunity transfer factors identified

VACCINATION IS ONE of the most successful interventions in reducing infectious disease worldwide, yet its effective protection of newborns against infections remains limited. Now, a study by HMS researchers at Massachusetts General Hospital and the Ragon Institute of MGH, MIT, and Harvard has determined how a pregnant woman's vaccine-induced immunity is transferred to the developing fetus, a finding that has implications for the development of more effective maternal vaccines.

While maternal antibodies against some diseases such as measles can be transferred to an infant, and provide some protection until an infant is old enough for individual vaccination, antibodies to other serious diseases like polio are less efficiently transferred. To investigate the mechanisms by which antibodies are transferred from mother to child, the research team used a tool called systems serology to compare the quantity and quality of antibodies against pertussis in blood samples from mothers and their umbilical cords, which carry blood, nutrients, and immune factors from the placenta to the fetus.

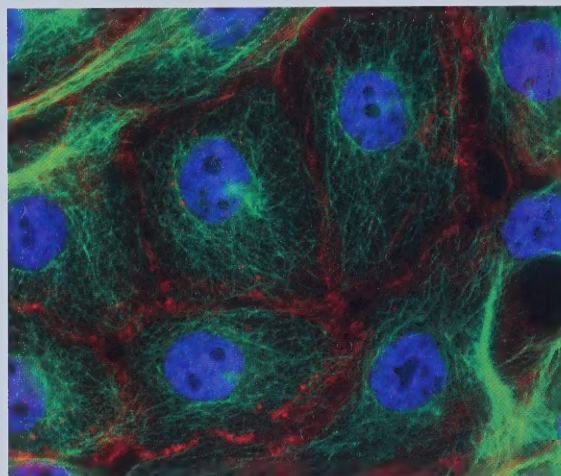
Their investigation revealed that the placenta preferentially sifts out and delivers to the fetus antibodies that activate natural killer cells, key elements of the innate immune system. Although several important immune cells are too immature in newborns to provide effective protection, natural killer cells are among the most abundant and functional immune cells during the first days of life.

Similar to their findings for pertussis, the researchers discovered a preference for placental transfer of natural killer cell-activating antibodies against influenza and respiratory syncytial virus, a common disease of childhood. The study provides insights into placental selection of antibodies, knowledge that could be used to develop next-generation maternal vaccines that elicit antibodies that more effectively transfer from mother to fetus.

Jennewein MF, *Cell*, June 2019

Immunology

Management of inflammation in animals found to stave off cancer recurrence



HMS researchers at Beth Israel Deaconess Medical Center have shown that preoperative administration of ketorolac, a nonsteroidal anti-inflammatory drug, stopped cancer cells from spreading in multiple tumor-resection models in animals. Preoperative administration of resolvins, anti-inflammatory factors made by the human body, produced the same result. Using the drugs in tandem produced synergistic antitumor activity, preventing surgery or chemotherapy from spurring dormant tumor cells to become tumors.

Panigrahy D, et al., *The Journal of Clinical Investigation*, June 2019

GENETICS

Gene-chemotherapy link may lead to heart disease

FOR MANY PATIENTS, cancer therapy has meant an improved prognosis and better long-term survival. Yet for others, these benefits have been accompanied by harmful side effects, including a type of heart damage known as cancer therapy-induced cardiomyopathy. This condition can compromise a patient's quality of life and long-term prognosis after the cancer has been treated.

Why some patients develop this condition while others do not may now be clearer because of the work of an international research team led by HMS investigators at Brigham and Women's Hospital. The team discovered that certain rare genetic variants may influence a patient's susceptibility, or risk, for developing the condition.

For their investigation, the team recruited around 200 adult and pediatric patients with diverse malignancies. All patients had cancer therapy-induced cardiomyopathy, and all had received anthracyclines, cancer drugs known to cause cardiotoxicity in up to 10 percent of patients who receive them. After sequencing the genomes of the participants and comparing them with those of reference populations, the researchers found a significant increase in certain variants of the gene *TTN*, which codes for the protein titin, among study participants.

The scientists reproduced and validated their findings in mouse models. Compared with controls, mice with the *TTN* variant were more susceptible to the cardiotoxic effects of the anthracyclines and had significantly impaired left ventricular function in their hearts.

García-Pavia P, Restrepo-Córdoba M, et al., *Circulation*, April 2019

CLINICAL MEDICINE

Radiation for lung cancer increases cardiac risk

THERAPIES THAT HAVE SUCCESSFULLY been used for patients with non-small cell lung cancer, such as a dose of radiation delivered to the heart, may also be increasing those patients' risk of adverse cardiovascular events, such as heart attacks and heart failure, according to a retrospective study by HMS researchers at Brigham and Women's Hospital and Dana-Farber Cancer Institute.

The team of investigators examined outcomes for patients with preexisting heart disease who had received treatment for locally advanced non-small cell lung cancer and found that the average radiation dose delivered to the heart was associated with an increased risk of major adverse cardiovascular events two years after exposure to radiotherapy. Among patients who did not have preexisting coronary heart disease, the risk of having a major cardiovascular event after treatment exceeded the rates in people considered to be at high risk of such events.

Although the success of radiation therapy has meant better long-term survival for

patients with non-small cell lung cancer, say the researchers, it has also meant that they live long enough to experience the risk of cardiac toxicity. Adverse cardiac events, they add, are happening earlier and more often than previously thought.

Lung cancer is the leading cause of cancer deaths in this country, and half of lung cancer patients will require radiation as part of their care. Previous studies have reported that advances in care, such as screening for lung cancer and treating the disease with targeted therapies and immunotherapies, have improved survival rates for patients. The average survival time is now more than two years for patients with locally advanced non-small cell lung cancer.

For this study, the research team analyzed data and outcomes for more than 700 patients diagnosed with non-small cell lung cancer and treated with thoracic radiation. A little more than 10 percent of the patients experienced a major adverse cardiac event in the two years following their course of treatment. The team noted that as the dosages of heart-radiation exposure increased, so too did the risk of cardiac events, especially among patients who did not have coronary heart disease before receiving radiotherapy. Among patients with a preexisting risk of coronary heart disease, the risk for a major cardiovascular event increased nearly fourfold, compared with patients who did not have a preexisting condition.

Based on their findings, the researchers recommend a more stringent avoidance of high-dose cardiac radiotherapy and suggest considering a much lower cardiac-radiation therapy dose limit for patients than currently specified in national guidelines.

Atkins K, et al., *The Journal of the American College of Cardiology*, June 2019

GENETICS

Rare mutations open new windows on autism

OVER THE PAST DECADE, autism spectrum disorder has been linked to mutations in a variety of genes, explaining up to 30 percent of all cases to date. Most of these variants are *de novo* mutations, which are not inherited, affect just one copy of a gene, and are relatively easy to find.

A recent study by HMS researchers at Boston Children's Hospital, however, tracked rare recessive mutations in which a child inherits two "bad" copies of a gene. The team's findings suggest that, contrary to prevailing thought, recessive mutations are more common in autism than previously believed, possibly explaining up to 5 percent of all autism cases.

Recessive mutations have been linked to autism in the past, mostly in small study populations. The new study used a large, geographically diverse cohort of more than 8,000 individuals in the international Autism Sequencing Consortium, which included more than 2,343 people with autism.

The researchers first looked for loss-of-function mutations that disabled the gene, causing it to encode proteins that were truncated and nonfunctional. They identified loss-of-function mutations that were both rare (affecting less than 1 percent of the cohort) and biallelic (affecting both copies of the gene) in 266 people with autism. Overall, people with autism were 62 percent more likely than members of the control group to have disabling mutations in both copies of a gene.

The team also looked for biallelic missense mutations, which involve a change in a single amino acid, and found that these mutations were significantly more common in the autism group.

After excluding genetic variants found in the control group and in a separate cohort of more than 60,000 individuals without autism, the researchers were left with forty-one genes that were knocked out only in those with autism. Eight of these had already been flagged in previous studies. The remaining thirty-three, including a gene that helps modulate the neurotransmitter gluta-

mate and another that is critical for making the neurotransmitter serotonin, had never been linked to autism before.

Although autism prevalence is known to be higher among males than females, previous studies, mostly of *de novo* mutations, have found that boys tend to have milder mutations and girls tend to have more severe mutations.

One explanation for this seeming contradiction, says the team, is that the female brain is more resistant to autism than the male brain. Their findings, in fact, showed that 1 in 10 girls had a biallelic knockout gene caused by either loss-of-function mutations or severe missense mutations.

Doan RN et al., *Nature Genetics*, June 2019

HEALTH CARE POLICY

Cap on residency hours doesn't hurt outcomes

A 2003 RULE that capped training hours for medical residents at 80 hours per week has not lessened the preparedness of physicians-in-training, say scientists in the Department of Health Care Policy in the Blavatnik Institute at Harvard Medical School.

Their analysis of more than 480,000 hospitalizations of Medicare patients before and after the reform indicated no significant differences in 30-day mortality, 30-day readmissions, or inpatient spending for patients whose physicians had completed their training before and after the residency hour reforms. The findings held true even for the sickest patients.


To avoid confounding the effect of changes in training with the effect of overall changes in hospital care, the researchers compared differences among new physicians before and after the reforms with those of senior physicians who had trained before the reform.

Jena AB, *BMJ*, July 2019

Eye Protection

HMS INVESTIGATORS at the Joslin Diabetes Center and Beetham Eye Institute have identified certain endogenous protective factors that help prevent complications such as advanced retinopathy from developing in some people with type 1 diabetes. Profiling compounds extracted from retinal and vitreous tissues from human cadavers, the researchers found elevated levels of four proteins in individuals who had not developed sight complications. One protein, retinal binding protein 3, was shown to protect both the neuroretina and the vascular retina from diabetes-induced retinal disease, in part by helping to inhibit retinol-cell uptake of glucose, thus dampening the production of inflammatory factors linked to retinal disease.

Yokomizo H et al., *Science Translational Medicine*, July 2019



An image of a retinal fundus, the interior lining of the eye, that exhibits no-to-mild diabetic retinopathy.

noteworthy

Primary care innovation can start at camp

For the past two years, the Center for Primary Care at HMS has joined with MIT to host the MIT-Harvard Medical School Healthcare Innovation Bootcamp. An outgrowth of the successful, long-running MIT Bootcamps program, this event focuses on the evolving needs of health care and represents one of the center's innovation and entrepreneurship training programs. Through these programs, the center aims to strengthen health care by educating students and providing them with opportunities to bring new thinking to health care and health care delivery, in the United States and elsewhere.

This year's program brought together more than sixty-five individuals representing more than thirty countries. Each participant arrived hoping to develop or hone skills that will help them take their ideas from concept to start-up.

According to Paola Abello (*fig. 1*), the center's director of innovation, the weeklong accelerated learning program is intensive. Participants attend lectures on health care, innovation, and entrepreneurship delivered by faculty from HMS and MIT. They also form teams that collectively develop plans for mock start-ups. By week's end, each team's plan is distilled to a pitch for its start-up. On "demo day," pitches are delivered to all participants, and their merit assessed by guest judges representing the venture capital, health care, and innovation sectors in Boston.

The pitch judged best at this year's bootcamp—"no prize, but a lot of pride," Abello notes—focused on how to use virtual reality games to motivate children with cerebral palsy to do physical therapy. As conceived, the game would be fun for the children while also allowing physical therapists to track and monitor the children's movements.

As an indication of how quickly these ideas can move, one of the judges thought of a potential investor that might be interested in the winning team's pitch and now hopes to make introductions.

In addition to the bootcamp, attendees can elect to participate in a three-day Healthcare Innovation Trek, an add-on program

that allows the "trekkers" to visit Boston-area companies that exemplify the area's innovation ecosystem and meet individuals who have been key to the development and implementation of new ideas in the local health care landscape.

Graduate education gains new leadership

HMS is welcoming a new dean for graduate education. Rosalind Segal (*fig. 2*), an HMS professor of neurobiology at Dana-Farber Cancer Institute and co-chair of the institute's Department of Cancer Biology, stepped into her new role in August. She will serve half-time as dean and continue her research in cancer biology and pediatric oncology at Dana-Farber.

As dean for graduate education, Segal is responsible for the strategy, oversight, and coordination of graduate education at HMS, including PhD and master's programs that encompass scientific, computational, and social science research pertaining to biomedicine. These include nine PhD programs based at HMS, six Division of Medical Sciences programs, and three programs held jointly by Harvard University and HMS, along with the master's programs that fall under the graduate education umbrella.

Segal is widely acknowledged for her success as a mentor to graduate students and as a teacher and leader in neuroscience, skills that make her optimally suited to this role. She is recognized for being community-minded, for her thoughtful approach to addressing the unmet needs of students, and for fully embracing the importance of training future leaders in science to advance the HMS mission.

During her tenure as graduate education dean, Segal will work to enhance the mentoring of students, to expand diversity and inclusion, and to increase cohesiveness among HMS graduate programs. In addition, Segal will enact the recommendations made last fall by a graduate education review committee and will work with faculty and administrative leadership to ensure the continuing quality of the School's training programs.

Segal succeeds David Golan, now HMS dean for research operations and global programs.

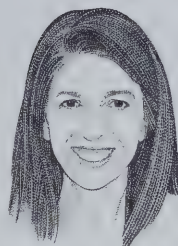


fig. 1



fig. 2



fig. 3

Postdocs burnish their science presentation skills

The fifteen presenters at the second annual Harvard Medical Postdoc Association's Elevator Pitch Competition had three minutes each to explain their work. Waiting to hear those explanations were friends, colleagues—and three judges, each a science communications professional.

When the pitches and nerves finally settled, the presentation by first-time participant Verónica Rendo, an HMS research fellow in medicine at Dana-Farber, had been judged the best (*fig. 3*). Her presentation focused on her work in the development of new techniques for distinguishing between tumors and healthy tissue in cancer treatment.

Second prize went to Ashlee Conway, an HMS research fellow in pediatrics at Boston Children's Hospital, whose work revolves around finding the source of porphyria, a group of diseases that affect the skin or nervous system. Lawson Ung, an HMS research fellow in ophthalmology at Massachusetts Eye and Ear, and Maruti Vijayshankar Mishra, an HMS research fellow in psychiatry at the VA Boston Healthcare System, tied for third place. Ung is using a diagnostic scanner to identify vision problems caused by infectious diseases while they can still be treated. Mishra is working to understand face blindness and is training people to overcome it.

Overall, the topics of the research pitches ranged from tumor microenvironments to pregnancy complications to biomarkers for aging.

Judges focused on organization, clarity, and significance, encouraging participants to clearly express the problem they were addressing, why it needed to be studied, how they were solving it, and whether the work could be broadly applied. Judges then scored the pitches based on structure and content, language and narrative style, and delivery. The judges also gave verbal feedback to contestants immediately following the pitches, further emphasizing the hope that the event could be a learning opportunity for everyone.

May I Take Your Order?

Guest Check

SERVER	TABLE	GUESTS	CHECK NUMBER
			926962
Cholesterol of blood glucose for vaccine			
TAX			
Thank You—Call Again			

W

ith high costs, low satisfaction, and nearly half of U.S. adults living with chronic, often preventable, conditions, it's no secret the nation's health care system isn't working for patients. Nor is it working for doctors, who complain of burnout brought on by time constraints, ever-growing bureaucracy, and interference from third-party payers. It's not even working for government, costing up to twice as much per capita as health care in other wealthy nations while consistently landing the country toward the bottom of global outcome rankings from infant mortality to life expectancy.

The good news is that a single strategy—patient empowerment—may improve all of these things.

It's not a new idea. In fact, patient empowerment has been around for decades. But now the growth of the internet is accelerating its rise, newer technologies are pushing it forward, national standards are increasingly enshrining it into mainstream thought—and study after study is showing that it works.

"You, the patient, have a unique body of knowledge about yourself that I can never hope to have," says Tom Delbanco, the John F. Keane & Family Professor of Medicine at Beth Israel Deaconess Medical Center. "And unless you happen to be a doctor, I have a unique body of knowledge about medicine that you, the patient, can never hope to have. Our job is to merge those two knowledge

bases to your greatest advantage, actually to our mutual advantage, since I succeed when you succeed."

Nothing like a good win-win. But how can proponents of patient empowerment make sure they're getting it right? How do they convince often-resistant stakeholders that increased patient engagement is a win-win? And perhaps most important, how can providers, employers, and social scientists change the long-entrenched behaviors of both patients and clinicians to realize this collaboration?

A clear view for all

"It's a culture shift," Delbanco says. "And that's what's hard about it. It's hard to change culture."

Change in medicine is notoriously slow, but in 2010 Delbanco, along with Jan Walker, an HMS associate professor of medicine at Beth Israel, introduced OpenNotes as a pilot program that offered patients secure online access to records of their primary care visits. At the time, the idea was considered radical—and it still is by many—even though today 40 million individuals have gained access to notes through secure electronic patient portals. In July, the practice was adopted in both the clinics and the wards of the National Institutes of Health Clinical Center. Delbanco predicts it will be the standard of care within five years.

Patients seem to love OpenNotes. They report it gives them more control of their care, helps them adhere to taking their medications, assists them in managing chronic conditions, and builds trust with their providers.

From the perspective of doctors, though, it's been a tougher sell. "If I stop a random doctor on the street and say, 'What do you think of the notion of sharing your notes

with your patients?’ half of them would smile and say good idea,” he says. “The other half might slug me.”

They worry, Delbanco says, that offering patients ready access to their doctors’ notes will mean more work for physicians, confuse or worry patients, and engender detrimental self-censorship, particularly on topics that may be sensitive, such as weight, mental health, or substance use disorder.

Delbanco allows that physicians have to adjust their language when using OpenNotes. “When patients see ‘SOB’ it’s different from what I see,” he says, “which is ‘shortness of breath.’” But the trade-off for maintaining electronic health records—considered a hassle by clinicians whether patients can see them or not—in this way is that care may be streamlined when patients are more informed about their care plans and diagnostic results. Perhaps even more important, Delbanco points out, 20 to 25 percent of patients find mistakes in their charts that “could make a difference” in treatment decisions and perhaps ultimately lead to decreased litigation.

Once doctors, nurses, and psychotherapists start using the system, most become converts, he says. “I view OpenNotes and OurNotes,” a new Delbanco-Walker initiative in which patients and clinicians cogenerate notes interactively, “like a new medicine,” Delbanco adds. “All medicines have contraindications for some patients, but most help more than they hurt. Greater transparency is a very powerful medicine.”

Transparency must begin in the workplace, where more than half of the U.S. population gets its health insurance.

The savvy consumer

Regina Herzlinger, the Nancy R. McPherson Professor of Business Administration at Harvard Business School, thinks transparency should start before a patient even enters a clinician’s office. It must begin in the workplace, she says, where more than half of the U.S. population gets its health insurance.

“People think of health insurance as a gift from employers,” says Herzlinger, “but most economists agree that it’s really just the employees’ income.”

Until 2017, she says, when unemployment reached a seventeen-year low and hiring and retention started becoming more difficult, employers were requiring employees to contribute greater and greater percentages to their health insurance premiums even as the value of the insurance declined, in part because of higher deductibles.

“And employees still don’t know what they’re getting for their money,” Herzlinger

adds, because the policies’ actuarial values—the percentage of likely expenses they will cover—are not disclosed up front.

“There has been some improvement,” she notes. “Health care consumers are more informed than they used to be, but if you compare the level of information they have available for health care decisions to what’s available for a purchase as mundane as yogurt, it’s still woefully short of what people need.”

The only way this will change, she maintains, is if journalists begin to focus on the inequities and if consumers consequently demand that government impose transparency requirements and mandate that employers offer a wider variety of plans from which to choose.

“I know this is a winnable battle,” Herzlinger says, offering as evidence the revisions that took place after employees in both the private and public sectors learned of employers’ mismanagement of pension funds.



Michael Barry

"Innovation in health insurance might sound oxymoronic," she adds, "but venture capitalists are investing in it because they know consumer unrest among employees is going to burst open."

One of the changes she proposes is more health plans from which employees can choose. But if that were to happen, how would they know which one would be their best choice? How can consumers be given enough accessible information to make savvy choices but not so much that they are overloaded?

Structuring choice

When Medicare Part D, the prescription drug benefit, was established in 2006, it offered nearly four dozen plans, a number that many economists, and 90 percent of doctors and pharmacists surveyed at the time, considered overwhelming. But, says Herzlinger, citing studies that suggest a learning curve, "the idea that there's too much choice in Part D is not by any means a foregone conclusion. What is clear is that competition has made premiums go down."

She points out that consumer education is the key.

"The missing ingredient in some studies that found consumers did not make optimal choices is they don't evaluate the quality of information offered to consumers, which differs by source, timeliness, and relevance." She'd like to see better online tools to measure risk aversion among consumers and specifics on various physicians—details such as who's

best at doing hip replacements on young athletes versus on older adult women—as well as metrics on items such as wait times for referrals and the likelihood that certain prescription requests will be refused by insurers.

This may sound like it would make choosing even harder—but it doesn't have to.

"Structuring choice sometimes means helping people to learn, so they can later make better choices on their own," write Cass Sunstein, the Robert Walmsley University Professor at Harvard and founder of the Program on Behavioral Economics and Public Policy at Harvard Law School, and economist Richard Thaler in their 2008 bestseller *Nudge: Improving Decisions About Health, Wealth, and Happiness*.

One simplifying strategy, they argue, is to institute a system of "collaborative filtering." This could mean insurance websites that would operate like those that media-streaming services use, prompting consumers to buy based on similar customers' choices. Another is the process of elimination: allowing consumers to set filters that reflect their priorities—such as lowest price, largest network, best diabetes clinics—and then sort search results in ways most useful to them. Plans that don't meet their criteria can then be easily crossed off the list.

Giving people a high level of information so they can weigh all the costs and benefits can be a good thing, depending on the situation, Sunstein says.

"There's a view of patient autonomy, a strong view," he maintains, "which says it's

Doctors may be surprised to learn that the decisions they deem medically best may not align with patients' wishes.

the doctor's responsibility to figure out what the patient wants and just do it." He contrasts that with a position he and Thaler call "libertarian paternalism," in which "choice architects," like government, health care providers, economists, and other experts, design user-friendly environments to guide people toward their best choices.

"Nudges can be aggressive or very soft," says Sunstein. "It should be a little like a GPS device, preserving free will but steering patients in a direction the doctor thinks is best. In some medical circles the word 'paternalism' is a conversation stopper, but sometimes it is a mercy to relieve patients of the burden of choice."

Different compass points

Other times, though, doctors may be surprised to learn that the decisions they deem medically best may not align with patients' wishes.

"It is tempting to think patients think like you in terms of what matters," says Michael Barry, an HMS professor of medicine at Massachusetts General Hospital and director of the Informed Medical Decisions Program at Mass General.

"But," he adds, "we've learned again and again in research that patients care about different things."

Barry advocates using shared decision making, or SDM, to arrive at the best treatment when there is more than one reasonable option.

"And," he points out, "there usually is."

"The missing ingredient in some studies that found consumers did not make optimal choices is they don't evaluate the quality of information offered to consumers, which differs by source, timeliness, and relevance."

“For so many conditions,” Barry continues, “people think there’s one right answer in terms of best treatment and that those who went to professional school know what it is. But different clinicians have different approaches, and once people understand there are options and that outcomes may differ, they’re enthusiastic about participating.”

One situation in which SDM is appropriate is in deciding treatment for prostate and breast cancers. For both, a watch-and-wait approach may be better for the patient than aggressive treatment, depending on many factors, including the location and stage of the cancer, the age of the patient, and the likely side effects of treatment. Even if treatment is deemed appropriate, choices must be made. In early-stage breast cancer, for instance, one choice is between mastectomy and lumpectomy with radiation. Research shows the survival rate is the same, so why not take the less aggressive approach?

“Well, the answer is that some women don’t want weeks of radiation or the chance of a recurrence in the same breast,” says Barry.

Nancy Keating, a professor of health policy and medicine in the Blavatnik Institute at HMS, uses shared decision making when helping women decide when to have mammograms.

“We’ve oversold the benefits and undersold the harms for many tests,” she says. With the message of early detection permeating our culture and the harms of false positives and overdiagnosis rarely mentioned, she adds, few women have an unbiased view of the risks that too much testing can pose.

Educating patients well in advance of a potentially worrying diagnosis could alleviate their stress when tough decisions need to be made.

As far as nudging goes, she says, she wants patients to understand why she thinks something is important, and vice versa.

“I had a patient with diabetes who didn’t want insulin,” she says, “and when I finally asked why, she said, ‘As soon as my mother started it, she needed her foot amputated.’ Once I understood that she had conflated treatment with the course of untreated disease, our discussion became easier, and she did eventually change her mind. We need to empower patients to talk to doctors, and doctors really need to communicate with patients and listen to them.”

SDM tools can help patients cut through pervasive marketing and often erroneous messages about tests, procedures, devices, and medications. Keating and Barry both think that educating patients well in advance of a potentially worrying diagnosis could alleviate their stress and help them think more clearly when tough decisions need to be made.

But changing doctors’ ideas of how their relationship with patients should work can be a “tough nut to crack,” Keating says. Ten years ago, Barry adds, clinicians pushed back on SDM, saying patients would fare better if they were simply told what to do. Today, the problem is more logistical, with physicians arguing they don’t have time to educate every patient and involve them in decisions. But, as with OpenNotes, SDM uses decision aids—including brochures, pamphlets, websites, and, especially for low-literacy and low-health-literacy patients, videos—that let patients learn about their options between visits to the clinic.

SDM is not about reducing the rate of screenings or invasive treatments, Barry points out. “The dramatic geographic variations we see in treatments raise the question of what rate is right,” he says, “and studies about that are starting to show that SDM helps achieve the right rate. One study found that using decision aids reduced rates of some procedures in populations that were already pretty well-served with those procedures. Another, using the same decision-making tools with people who were underserved, found that the rates went up. So SDM is also a way of combating health disparities.”

Still, Barry says, many people who could benefit from shared decision making don’t get to take part in it. “There are many reasons for that,” he says. “Many clinicians still think it will take more time, and frankly, given that most health care values piecemeal, it may be economically advantageous to just do stuff rather than talk to people about why something may not be necessary.” Also, he adds, “paternalism dies hard.”

The right motivation

Traditional paternalism—the “we were gods, you were supplicants,” sentiment that Delbanco recalls was his mother’s conception of the doctor-patient relationship—does seem to be waning as patients inevitably become more involved in their own care through technology, from apps to implantable devices that can monitor everything from sleep quality to chronic conditions like congestive heart failure, as well as through consumer-driven

“I had a patient with diabetes who didn’t want insulin and when I finally asked why, she said, ‘As soon as my mother started it, she needed her foot amputated.’”

websites and online forums that are building collective knowledge.

"We're not going to get to where we need to be if we rely solely on the medical care system," says Sara Singer, an adjunct professor of health care management and policy at the Harvard T.H. Chan School of Public Health and a professor of medicine and organizational behavior at Stanford University. "We need to integrate medicine with social services and other systems and sectors, including the corporate sector."

Workplace wellness programs, offered by 80 percent of large U.S. employers, took a hit

in April when a study in *JAMA*, coauthored by Zirui Song, MD '10 PhD '12, reported that a randomized clinical trial of nearly 33,000 employees working across the country for a single warehouse company found no significant differences in outcomes between employees who used the retailer's wellness program and those who didn't. But Singer, a lead researcher in the Culture of Health Program at the Harvard Chan School, a collaborative public health effort that aims to engage companies in consumer, employee, community, and environmental health, says part of the problem is the way certain wellness programs are run.

One of the best ways to inspire people seems to be having them put some skin in the game, betting their own money that they can meet a personal goal.

"It's not helpful to provide free food, for example, so people don't have to leave the building," she says. "A lot of the quote-unquote wellness stuff we're doing is designed to keep people producing at work. That's not going to increase good health."

Of course, it's also possible that our knowledge about behavior modification is not yet refined enough to capture all the variables of human behavior. It's well documented that social networks, including those among colleagues, can influence health, but incentives like yoga mats or spa gift certificates aren't always as motivating. Penalties for unhealthy behaviors, like having to stand outside to smoke, work slightly better, but one of the best ways to inspire people seems to be having them put some skin in the game, betting their own money that they can meet a personal goal within a given time frame. That's because "losing something makes you twice as miserable as gaining the same thing makes you happy," according to Thaler and Sunstein.

Another way to achieve patients' buy-in goes back to involving them more in clinical practice. Singer researches ways to transform health care delivery and has found that primary care and surgical teams that involve patients and their families have better patient outcomes than those that don't.

"Focusing on the patient was the differentiating factor," she says.

This kind of human-centered approach will have even larger implications as technology increases and genomics, artificial intelligence, big data, and other yet-unimagined advances play a bigger role in health care.

"There's a great and present danger that as our knowledge expands and options mushroom individuals will feel overwhelmed. Guiding people through the growing morass will be quite a trick in the future," says Delbanco. "But patients are far more resourceful than we health professionals give them credit for. Activating the patient in a healthy way and having true transparency join with expert consultants will get more complicated, but it's also likely to bring increasing success." ■

Elizabeth Gehrman is a Massachusetts-based writer.



Nancy Keating



Many are flummoxed over how to improve health care delivery. But for some doctors, the answer is clear—meet patients where they are



The New Black Bag

BY JESSICA CERRETANI

It's a sweltering summer morning outside Dallas, and the doctor's bag weighs heavy as the physician stands on the porch, waiting for the door to open. When it does, she's greeted with wide smiles from her three young patients and their mother. They welcome her inside, hand her a glass of water, and clear a place at the table. Over the next two hours, the pediatrician checks the children's vitals, conducts physical exams, and writes any necessary prescriptions. She catches up with the family, too, listening intently to the details of their lives and plans for the coming school year. When she departs, the goodbyes are like those to an old friend.

Today, such a scenario seems quaint. But for Tonya McDonald, MD '98, it's business as usual. This past spring, she opened Radiance Pediatrics, a direct primary care practice that provides in-home and virtual pediatric care to families who pay a flat monthly fee. For this fee, families get extended visits, same- or next-day appointments, telemedicine visits, and direct access to McDonald through phone, text, and email.

"In some ways, this is a throwback, an old-school approach to medicine," she admits. "But it gives me the opportunity to help rebuild the doctor-patient relationship. It's a gift to be able to truly bond with families."

Not long ago, McDonald was part of the 78 percent of U.S. physicians struggling to cope with burnout, a problem some have labeled a public health crisis.

"In the past five years, I was seeing up to thirty children a day, feeling sad that I couldn't practice medicine the way I wanted," McDonald says. "Insurance dictated what I could do."

McDonald knew it was time for a change. And she's far from alone.

"People point to our salaries as an issue," says Rushika Fernandopulle, MD '94, "but

the real problem is that the job of primary care itself can be awful. Until we fix that, no amount of money will matter.”

For Fernandopulle, founder and CEO of team-based primary care provider Iora Health, that means rebuilding the field.

“Imagine that it’s 1902 and we want to get from Boston to London in a day and all we have are ships,” he muses. “We need a plane, but you can’t just slap wings on a ship.”

“Incremental change hasn’t worked,” he adds.

Then, like McDonald and others working in primary care today, Fernandopulle gets to the heart of the matter, “Let’s stop making excuses and build what we know primary care should be.”

Patients’ voices

Even as physicians like McDonald and Fernandopulle find themselves at the forefront of an evolving field, they acknowledge that much of the transformation in primary care is being driven by patients themselves. Dissatisfied with long waits, short appointments, and inadequate access to physicians, patients are voting with their feet and increasingly moving their care to models that prioritize wellness, relationships, and continuity.

Giving patients a voice—and listening to that voice—might seem faddish, but for some physicians, this has been the norm for decades. It’s an approach that James O’Connell, MD ’82, learned early in his career working with Boston’s homeless population.



Rushika Fernandopulle

As the first doctor for the nonprofit Boston Health Care for the Homeless Program, O'Connell quickly discovered that many of the qualities he was taught to value, like speed and efficiency, had to be tossed out the window. To gain his patients' trust and respect, O'Connell needed to meet them where they were—usually literally—and establish solid relationships.

"This population hated people like me, who were there to 'do good' for a year and move on," he says. "They wanted what we all look for in a doctor: Someone to form a relationship with over time."

Nearly four decades later, O'Connell says his patients continue to drive the conversation about what primary care means, whether that's being on call for late-night visits on the street or ensuring continuity of services after a patient receives housing. For the men and women O'Connell sees, these are needs born of the realities of living on the street. In some ways, those needs mirror the shortfalls of primary care as a whole.

"The homeless population will show you the weaknesses in the traditional health care system without even trying," he says. "They continue to teach us how we've been doing things wrong."

Giving patients a say in care delivery is also integral to Sonya Shin's work with the Navajo Nation. Shin, MD '98, is an HMS associate professor of medicine at Brigham and Women's Hospital and the director of Community Outreach and Patient Empowerment (COPE), which is part of a joint trib-

al-Indian Health Services effort to address health disparities in the Navajo Nation. In the decade since its inception, COPE has strengthened relationships between physicians and community health representatives (CHRs), who are public health workers and members of the Navajo Nation community. COPE has also created a team approach to primary care for its patients, many of whom live in poverty and have diagnoses of chronic conditions such as diabetes and cardiovascular disease.

The citizen-patients of Navajo Nation aren't afraid to voice their opinions about health care, and they have the means for doing so. A number of programs, including patient and family advisory councils, allow patients to meet with tribal elders, executive leadership, and clinicians to advocate for quality care. Their insight, says Shin, has helped improve communication between physicians and CHRs.

"It takes a lot of time to work with the community and build trust; we can't just give lip service to their needs," she explains. "Our providers are grateful for the patients who have really thought about the changes that need to be made in care delivery."

Group practice

Making primary care a team-based endeavor is one significant change.

In the Navajo Nation, where patients with chronic diseases may see a physician only every six to 12 months, CHRs have been a critical part of primary care delivery

Enhanced interaction between clinicians and CHRs may be linked to better outcomes in patients.

since the 1960s. There had been, however, a disconnect when it came to ensuring that physicians and CHRs were keeping each other in the loop regarding patients' health.

"Doctors work at hospitals; CHRs work within the community," says Shin. "They were practicing in separate spheres."

To address this disconnect, Shin and her colleagues at COPE began mapping the care process, implementing electronic health records for referral and CHR documentation, and creating teaching materials to train physicians and CHRs to work together for patients.

"As doctors and nurses, we've never really been trained how to work with community partners," says Shin. "The options outside the clinic walls don't pop up in my psyche unless I've been taught to think that way. It's not rocket science, but it was an aha moment for me when I realized we needed that sort of change."

The approach has paid off. A 2017 study published in *BMC Public Health* found that more than 80 percent of CHRs felt strongly that COPE trainings were useful, while nearly 45 percent believed that communication and teamwork had improved because of COPE's initiatives. What's more, early data suggest that enhanced interaction between clinicians and CHRs may be linked to better outcomes in patients, including improved lipid profiles and A1c values.

CHRs and health coaches also play an important role in primary care at Fernandopulle's Iora Health. At the provider's prac-

"Imagine that it's 1902 and we want to get from Boston to London in a day and all we have are ships. We need a plane, but you can't just slap wings on a ship."



James O'Connell

tices throughout the United States, patients receive care not only from a physician but also from a team of professionals that includes community-based health coaches, behavioral health specialists, social workers, and nurses. According to Fernandopulle, patients who visit an Iora practice—intentionally kept small and situated in accessible locations such as strip malls—are met by a dedicated greeter before being seen by all members of their core health care team in one visit. After a patient visits, the team huddles and discusses next steps for helping that patient achieve their health and wellness goals. That might mean providing clinical advice, involving a support group, or recommending specialty care.

“We can’t just tell patients what to do,” says Fernandopulle. “We need to help them develop a plan and execute it.”

At Iora, health coaches perform outreach, working with patients in their community to improve adherence to treatment and address such social determinants of health as access to healthy food, safe public spaces, transportation, and other environmental factors that influence health and perpetuate health inequities.

Fernandopulle recalls an older woman who had moved to a new city and lacked a car. Worried about being a burden on her family, she isolated herself by staying at home, and she became sedentary, which worsened her diabetes.

In an Iora team huddle, her physician asked if she needed a higher dose of medication.

“No,” her coach replied, “she needs to get more engaged.”

Her coach taught the patient how to take public transportation and encouraged her to join a local social group. With time, her blood-sugar levels improved.

Such results are impressive to clinicians but not necessarily to insurance companies in the traditional fee-for-service system. “There’s no CPT code for ‘teach patient to ride the bus,’” Fernandopulle says ruefully. “So in most practices, no one thinks of doing this—even if it’s the right thing to do.”

People power

By placing primary care at the top of the funnel, Fernandopulle hopes that Iora will shift the current specialty-driven power dynamic in medicine.

“We think that primary care is the best platform for fixing health care as a whole because it’s closest to the consumer,” he says. “We can help patients upstream by encouraging them to eat better and exercise and downstream by helping them navigate choosing a specialist. When you flip the model, primary care now becomes the center of the health care system.”

Access to specialists is getting a makeover, too. Traditionally accomplished through referrals and marred by lengthy wait times, seeing a specialist can be fraught with frustration. Companies like InfiniteMD, co-founded by Elizabeth Kwo, MD ’09, who is also the company’s CMO, are seeking to change that, relying on tele-

“The homeless will show you the weaknesses in the traditional health system without even trying. They continue to teach us how we’ve been doing things wrong.”

medicine to offer patients virtual second-opinion consultations with specialists. The service, available worldwide to people who self-pay or whose employers provide the service, allows patients to video chat with top-ranked oncologists, neurologists, pediatricians, and other specialists.

“Physicians don’t have the capacity to see hundreds of patients a day, but you can streamline that process by having patient coordinators work with patients to review their records and help them winnow their concerns to just five questions,” says Kwo. By paying specialists for their time directly, the company moves its customers to the front of the line, giving them the opportunity to gain medical insights quickly.

“Getting specialists to weigh in on complicated cases can be really helpful for patients

and for community doctors,” she says. “We’ve had cases where our specialists have led people to better treatment or helped them access clinical trials.”

Support systems

Any changes in health care delivery generate the question of who pays. For now, the answer depends on the model—and the differences can be notable.

The model that O’Connell describes is “the other side of concierge medicine.” That means allowing for an on-call, no-appointment system in which a clinician’s hospital affiliation automatically makes homeless people patients of that clinician’s hospital, even if they never set foot inside it. About three-quarters of the caregiving costs for patients of Boston Health Care for the

Any changes in health care delivery generate the question of who pays.

Homeless are covered by Medicaid, with the remainder coming from grants and philanthropic support.

“When people live on the streets, they end up subjugating their health care needs to simply trying to stay alive,” O’Connell says. “They come to the emergency department when they’re very sick. If we want to provide ongoing care of chronic diseases, we need to go to them.”

Iora Health partners with companies to make its services available to employees; Medicare Advantage patients also make up a large portion of its population. But it began as essentially a direct-care model, in which people pay about \$40 a month for team-based primary care services. “The current health care system is all about transactions, but when did transactions ever heal people?” says Fernandopulle. “We want to stop the madness of fee-for-service reimbursement and the games that go with that.”

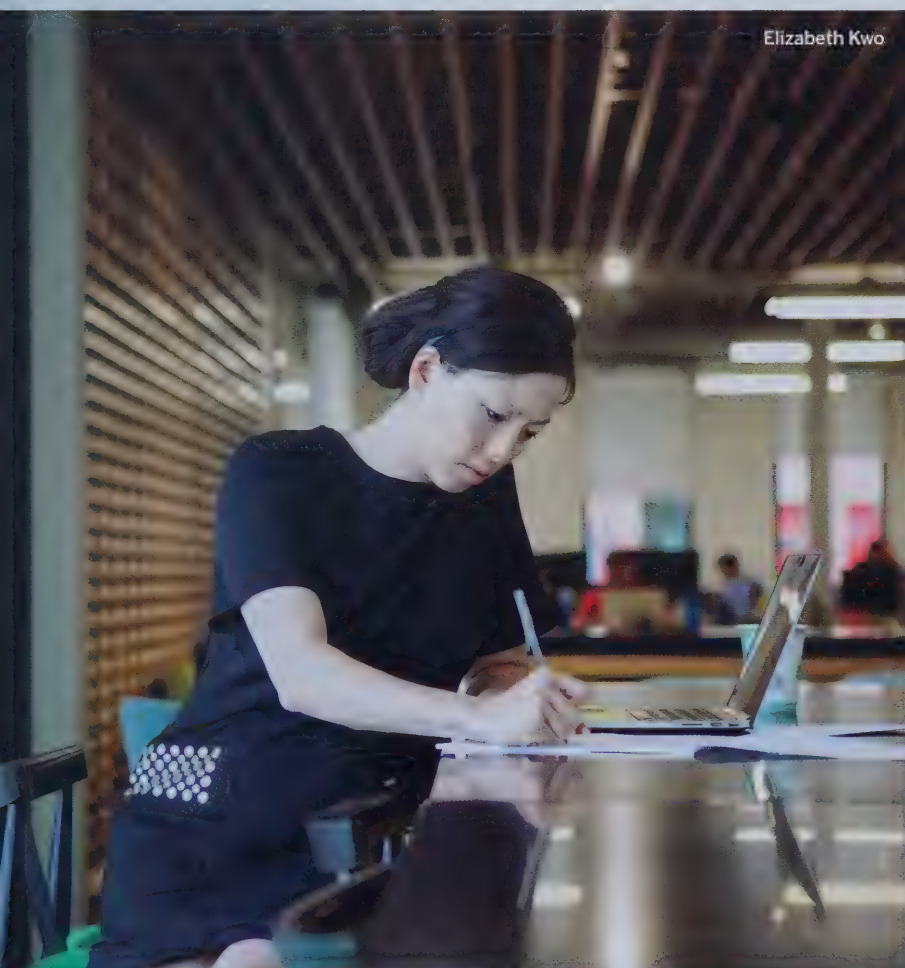
Radiance Pediatrics is also a direct-care model but one that eschews insurance altogether. McDonald does, however, encourage parents to carry some form of coverage, such as catastrophic insurance. Families pay a per-child monthly fee, ranging from \$75 to \$125 depending on the age and number of children.

“It’s reasonable over the long term if parents are self-employed and their kids have chronic health issues,” she says.

It’s a harder sell for families who need only an annual well-child visit, but McDonald says she also sees families who are insured yet willing to pay out of pocket for her availability and the convenience of house calls. Her practice also appeals to members of health-sharing ministries, organizations in which members with similar religious or ethical beliefs share health care costs. Such ministries often don’t cover well-child care.

“This isn’t necessarily the right approach for everyone, but it’s one way that we can try to reclaim primary care,” says McDonald. “Good health care shouldn’t be about dollars and cents. It should be about our relationships with patients—which is why we got into medicine in the first place.” ■

Jessica Cerretani is a Massachusetts-based writer.



Elizabeth Kwo



READY 4
MED ED
2.0

Medical education needs
to use a long lens when
preparing young doctors
for careers as primary
care practitioners

Adaptive Learning

BY ANDREA VOLPE



early a decade ago, the passage of the Affordable Care Act galvanized monumental changes in the U.S. health care system for patients and providers alike, beginning with expanded health care coverage for 20 million people in this country. The new models of care that formed the foundation of the ACA highlighted the potential of team-based primary care to tackle preventive care and population medicine while also managing costs.

This move toward team-based care may also reflect a demographic necessity. The Association of American Medical Colleges (AAMC) predicts a primary care physician shortage of between 21,100 and 55,200 physicians by 2032. Coupled with that prediction is its estimate that, in the same period, the number of physician assistants and advanced practice registered nurses will double. It's likely, then, that some of the care traditionally provided by physicians will come from allied advanced practice providers.

Faced with such challenges and change, how is medical education responding? How are curricula being revamped to better provide future physicians with the skills needed to navigate the evolving demands of the profession?

Study one, teach one

These are questions Richard Schwartzstein, MD '79, thinks about a great deal. In the early 2000s, Schwartzstein, the Ellen and Melvin Gordon Professor of Medical Education at Beth Israel Deaconess Medical Center and the director of educational scholarship at HMS, and his colleagues began to notice that HMS students seemed less engaged with the curriculum. Call it the google effect: When it came to gaining factual information, the ease of acquiring facts with the stroke of a key was soon at cross-purposes with the holistic approaches to learning essential for developing clinical reasoning skills. In addition, a lecture-heavy curriculum that placed basic science in the first two years, followed by more patient-focused courses in the third and fourth

years, unwittingly reinforced the separation between scientific and clinical knowledge.

HMS medical educators weren't alone in noticing these trends. In 2004 the AAMC reported that the design, content, and form of medical education lagged changes in the biomedical sciences, the way health care was organized and delivered, and society's expectations of medicine and health care. The organization called for a more integrated, interdisciplinary, and patient-centered curriculum.

In 2007, under Schwartzstein's leadership, HMS hosted a conference sponsored by the AAMC and the Carl J. Shapiro Institute for Education and Research at Beth Israel Deaconess, which led to the creation of a national medical education research agenda and kick-started research into curriculum change.

Traditionally, research in medical education had been more descriptive than scientific. Schwartzstein helped pioneer an empirical approach to medical education, using experimental studies to test educational innovations and ensure that new approaches to teaching will lead to more competent physicians and better patient outcomes.

Then came *Educating Physicians: A Call for Reform of Medical School and Residency*, published in 2010 by the Carnegie Foundation for the Advancement of Teaching. The report appeared one century after Abraham Flexner's noted critique of U.S. medical education. That critique set the stage for the now-familiar system of science-based academic medical education and university teaching hospitals. The Carnegie study, by contrast, found that medical school curricula nationwide were overly focused on mastering facts. The study's authors wrote that curricula lacked connection between "formal knowledge and experiential learning." The authors also found inadequate attention to patient populations, health care delivery, and the effectiveness of various diagnostic and therapeutic interventions, and they worried that doctors-in-training did not fully understand the broader civic and advocacy roles of physicians.

The path taken

At HMS the Carnegie report kindled discussions over the shape of undergraduate medical education and sparked evidence-based research on curriculum design. The result: the Pathways curriculum, launched in 2015.

On a more philosophical level, however, the Carnegie report prompted HMS educators to reflect on what it means to be a well-trained physician when the practice of medicine is continually changing.

"It's my belief that we shouldn't be focused entirely on putting out a doctor who's perfectly trained to practice tomorrow," Schwartzstein says. "Our students are going to have careers that span several decades. Whatever it is that they're prepared for on day one of residency is not going to be what they're going to do five years later, let alone thirty-five years later."

Schwartzstein is a proponent of what he calls the "liberal arts equivalent" of medicine and favors encouraging students to pursue a broad-based foundation upon which they can layer specialization. He cites his own training as an example. Although Schwartzstein now practices internal medicine and pulmonology, as a medical student he took rotations in ophthalmology, sports medicine, and dermatology to complement the more specialized training he would receive during residency.

"Medicine is a profession and that carries with it ethical, moral, and scientific obligations for how we prepare ourselves for this long career. We have to be able to continue our growth and development as learners," he says.

One aspect of the evolving health care system that's on Schwartzstein's mind when it comes to educating the next generation of physicians is the rise of team-based care.

"In a health care system in which doctors are likely to be supervising teams of other health care professionals, they're going to need to be able to recognize subtleties in data or cases being presented to them by others and to avoid framing bias," he explains.

Schwartzstein also thinks it's important to nurture essential habits of mind. Curiosity, critical thinking, and integrity are trademark qualities, he says, that will allow

The Carnegie report prompted HMS educators to reflect on what it means to be a well-trained physician.

the next generation of doctors to provide high-quality care no matter what the health care system of the future looks like.

The future of learning at HMS, Schwartzstein says, will be both iterative and shaped by evidence-based research on what works best in medical education. The past decade of curriculum reform follows a tradition of professional introspection spawned by Flexner. It is by necessity a level of change that can come only from the top of the profession.

Inside, out

Grassroots change, however, comes from throughout the ranks.

In 2009, at the same time that Schwartzstein and other leaders in medical education were reflecting on how to make the medical school curriculum more responsive to transformations in health care, Andrew Morris-Singer, MD '07, then a second-year internal medicine resident at Brigham and Women's Hospital, was thinking about how to meet medicine's need for change in care delivery, specifically in primary care.

At the time, says Morris-Singer, HMS had just proposed suspending funding for its Division of Primary Care as part of an administrative restructuring plan. Given that the nation was in the throes of debates that would result in the ACA, it was a decision Morris-Singer remembers as being "out of sync with where the country and our health care system needed to go." Together with other HMS students and medical residents, he formed the Harvard Primary Care Reform Working Group in the hope of appealing to HMS leaders to restore funding. There was a petition drive, followed by town hall-style meetings.

A large-scale review, led by a former dean of the School, resulted in the creation of the HMS Center for Primary Care in 2011. Morris-Singer is an affiliated faculty member of the center.

The model for Morris-Singer's approach to advocating for primary care originated with his experience as an organizer in communities facing anti-LGBTQ ballot measures. As an LGBTQ community organizer, he says, he learned the power of mobilizing diverse groups of people

around shared interests and "the importance of someone understanding their own ecosystem." Although the goal of community organizing is to effect change, he came to realize that cultivating "mind-set shifts and new narratives among stakeholders and decision makers" was a necessary precondition to establishing significant change.

The working group drew the attention of students at other U.S. medical schools, and Morris-Singer began to think more broadly about what it would take for health care providers to see themselves as agents of change. This thinking led to his founding, and now leading, Primary Care Progress.

Drawing on social movement strategies and social psychology research, PCP's programs teach leadership and teamwork skills to medical students, physicians, and allied health care providers that will help them navigate a health care system that expects increased productivity and patient satisfaction while also expecting providers to grapple with declining reimbursement and large-scale adoption of electronic health records—all workplace factors that contribute to what many describe as an epidemic of burnout in the profession.

The new guard

Some of the skills vital to navigating this change, says Morris-Singer, fall within a concept known as "relational leadership."

"A relational leader is someone who doesn't just focus on the what and how of their work, they focus on who," he explains. Relational leadership isn't a fixed position, instead it's a "mind-set and interpersonal orientation" available to all health care providers depending on context.

Think of it as a series of concentric circles with a medical student, physician, or other primary health care provider at the center. When providers apply growing self-knowledge to improve how they work in groups, their ability to communicate and collaborate is strengthened, they are less susceptible to burnout, and their positive influence frequently brings out the best in colleagues.

The potential of relational leadership doesn't stop there, according to Morris-Singer. When health care providers gain



Richard Schwartzstein



Andrew Morris-Singer founded Primary Care Progress nearly a decade ago and now serves as its chair.

greater insights into how they learn and work in teams, they also become more collaborative, innovative, and strategic contributors to those teams. They become better prepared to advocate for change and spur innovation from inside the systems in which they work. The same tools that allow medical students to pilot primary care programs during residency, he says, can be used by established physicians to initiate change in their practice groups.

PCP's academic programs run on two tracks adjacent to formal medical school curricula and are founded upon the leadership development strategy that underpins the organization's Relational Leadership Institute. Its Student Action Network serves as an umbrella for a variety of interprofessional student programs, including collaborations with the American Academy of Family Physicians, which focuses on family medicine through the Primary Care Leadership Collaborative, and with the Interprofessional Student Hotspotting Learning Collaborative.

According to the Camden Coalition of Healthcare Providers, the student hotspotting collaborative is an annual program that aims to train interdisciplinary teams of professional students to use a patient-centric approach when working with individuals with complex medical and social needs. PCP co-hosts the collaborative; other co-hosts include the Camden Coalition, the AAMC, the National Academies of Practice, the Council on Social Work Education,

and the American Association of Colleges of Nursing.

PCP also sponsors and coaches seventeen U.S. university-based student cohorts. At HMS, for example, the Center for Primary Care Student Leadership Committee (SLC) has been part of PCP since the nonprofit committee was founded.


According to Russell Phillips, the director of the School's Center for Primary Care and the William Applebaum Professor of Medicine at Beth Israel Deaconess, the SLC grew out of the student group that advocated for the creation of the HMS center.

"That spirit of advocacy continues within the SLC," says Phillips. "Today we work to empower students to become leaders and innovators in primary care. The committee provides a platform for interprofessional dialogue and collaboration, crucial for establishing team-based problem-solving skills the students will enhance throughout their careers."

The SLC's current community-based project is advised by Sara Selig, an associate director for the Community Outreach and Patient Empowerment Program, the domestic affiliate of Partners In Health, and based at Brigham and Women's Hospital. Selig is an HMS instructor in medicine in the hospital's Division of Global Health Equity. The project focuses on working with community stakeholders to create resources that encourage providers to practice cultural humility with the aim of delivering culturally competent mental health care.

To innovate, by definition, is to make a change and do something new. It's become an axiom that what our health care system needs from every quarter is change. One sector calling for change is society as a whole.

Another is academia. The curricular innovations of the past decade—inside and outside medical schools—are a bellwether. When pedagogies change, it's a sign that educational institutions recognize a need to evolve to better serve their mission.

As educators, Schwartzstein and Morris-Singer are answering both calls. 

"A relational leader doesn't just focus on the what and how of their work, they focus on who."

Andrea Volpe is a Massachusetts-based writer.

The development of new medical devices requires many hands and moments of inspiration

Sparks can fly when two HMS students put their heads together. Or, in the case of Howard Simpson, MD '35, and A. J. Derbyshire Jr., PhD '35, inked tracings of the brain's electrical activity.

In 1933, Simpson and Derbyshire approached physiology professor Hallowell Davis, MD 1922, with an idea: they wanted to recreate German psychiatrist Hans Berger's obscure experiments describing the human brain's rhythmic electrical output. The HMS Department of Physiology was an ideal place to conduct this work, they thought, as it had an impressive electrical amplification apparatus built by Davis's mentor, the pioneering U.S. electrophysiologist Alexander Forbes, MD 1910.

Davis was skeptical, however, believing that the so-called Berger waves were artifacts of the electronics themselves. Simpson and Derbyshire's initial failure to amplify readings from electrodes placed in their own scalps seemed to support Davis's skepticism. It wasn't until the students put electrodes into Davis's own head that they detected what was unmistakably a 10-per-second rhythm—a Berger-wave rhythm. Apparently, Davis had stronger alpha waves than his students.

Immediately realizing the clinical and experimental potential of these findings, Davis asked the department's electrical engineer Lovett Garceau to build a device to visualize these waves. Garceau adapted a Western Union "undulator," designed to record the telegraphic signals from transatlantic submarine cables, to capture the brain's signals on streams of paper tape. A similar device had been developed in Berlin for use in animal experimentation, but Garceau's portable, inexpensive-to-operate ink-writing oscillograph was a first and it launched the use of the electroencephalogram in the United States.



Davis and Garceau published their findings in the December 1935 issue of the *Archives of Neurology and Psychiatry*. In that same issue, Davis joined Harvard neurologists Frederic A. Gibbs and William Lennox, MD 1913, in reporting the first experimental usage of the Garceau oscillograph in their paper "The Electro-encephalogram in epilepsy and in conditions of impaired consciousness."

The EEG device generated a buzz within the HMS faculty. Many volunteered to have Davis record their waves. Preserved in the Countway Library's Center for the History

The undulator, a telegraphic signal recorder adapted to produce ink tracings of the brain's electrical activity, launched the use of the electroencephalogram in the United States.

of Medicine, for example, are the 1940 readings from the brain of poet and Harvard psychiatrist Merrill Moore, who noted that his own wave print "did not show very much in particular but in spots indicate that I was momentarily drowsy, having to work late the night before."

—Dominic Hall

Dominic Hall is curator of the Warren Anatomical Museum in the Center for the History of Medicine at the Francis A. Countway Library of Medicine.

Permanent Ink

BY SACHIN JAIN

Notes from patients fill the recesses of physicians' desks. Why?

Most of us

have a folder. Or a shoebox. Perhaps a desk drawer. Or a special, yet aging, briefcase.

We may not look in it very often—or ever. And we may not admit to having one. But we do.

I'm referring to the collections of letters of appreciation that we physicians receive from our patients and their families. These collections, I've discovered, are something of a secret in medicine, something we rarely discuss. Why do we keep them? What do these letters mean to us as professionals?

I think we keep them because we need to feel the sense of gratitude from our patients contained in these notes. I was inspired at a young age to become a physician because of my father, an anesthesiologist and pain management physician. Early on, I associated his career with the notes of appreciation and the baked goods (hey, I was a kid!) that his patients would often send to thank him for his work. By the time I became a student at HMS, I was less concerned with gifts. But I did think about gratitude.

Then I began to train at Brigham and Women's Hospital in internal medicine. Sometimes I'd see a patient just once. Other times I'd visit a patient's bedside several times a day. Rarely did we develop the strong relationships I'd imagined, given my father's experiences. And rarely did my patients express much appreciation for my work. It's not that I think my patients weren't grateful. Instead, I think that in the hospital setting my patients were focused, understandably, on a thousand other matters besides contributing to a young doctor's sense of self-worth.

Soon enough, however, the letters started arriving.

"It is so hard to find words or ways to thank you for what you have done for us," wrote one patient. "You have a family in Boston to turn to whenever you need it!"

I still go back and read that note from time to time. It's with my other letters, in a manila folder, in my home office. Whenever I rediscover the folder, its contents invariably make me feel better.

Doctors' notes

I recently asked colleagues, friends, and mentors about the letters of appreciation they've received from their patients and what those letters mean to them. I received some interesting reactions.

"I don't depend a lot on gratitude," says Joel Katz, an HMS associate professor of medicine who directs the Internal Medicine Residency Program at Brigham and Women's. "I want to impact people and see them get better. That's how I get my satisfaction as a physician."

Nevertheless, he adds, "When I get a thank-you note, I appreciate it. And I try to respond to it."

"They feel like a gift," says Nancy Oriol, MD '79, an HMS associate professor of anesthesia, lecturer in the Department of Global Health and Social Medicine in the Blavatnik Institute at HMS, and the School's faculty associate dean for community engagement in medical education.

Oriol keeps all of the notes her patients send her. One that stands out came from a patient she saw in the Family Van, a Boston-based mobile clinic.

"Thank you for giving us what we need," wrote the patient.

"Just seeing that made me think about the role we played in that woman's life," says Oriol. "It filled me with awe."

When I asked Russell Kerbel about the role patient gratitude plays in his life, he said, "It rarely crosses my mind." Kerbel, a hospitalist and an assistant professor of medicine at UCLA Medical Center, typically sees fifteen to twenty patients each day.

"Gratitude is not something that I show up at work wondering about," he says. But that doesn't mean he doesn't care what patients have to say after he walks out of their hospital room. Kerbel makes it a habit to hand out his business card, which includes his personal email, to every patient he sees. Sometimes, he'll get a thank-you note. These get saved on his computer in a folder called Patient Letters.

"I'll be honest," says Kerbel. "I've never opened it. But when I receive a note, I place it in the folder."

More important to Kerbel is when a hospitalized patient or their family member asks if he's accepting new patients in his office practice. He doesn't have an office practice.

"I take that as the highest compliment," he says. "It demonstrates that this person or their family trusts me and would want me in their lives for the foreseeable future."

One physician who gets a lot of thank-you notes is Michael La Quaglia, a pediatric surgeon and the Joseph H. Burchenal Chair in Pediatrics at Memorial Sloan Kettering Cancer Center. Though many of La Quaglia's patients are too young to write him notes themselves, their families often do.

"I think it's good, positive feedback," says La Quaglia. "But the be-all and end-all is, in your mind, knowing you've done the best you could."

Unlike some of the other physicians I spoke with, La Quaglia says that many of the letters he receives are from families whose

children died in his care. He doesn't focus on the content of those letters so much as he does on the people who wrote them.

"Taking care of the human being and the family is the reward," he says. "The fact that I've done something good for somebody is what keeps me going even if the outcome isn't positive."

Peerless words

After speaking to my fellow physicians, I began to think that gratitude may not be as important as I initially thought. Then I talked to Andrew Morris-Singer, MD '07. He founded and runs Primary Care Progress, an organization working to improve the primary care experience for patients, physicians, and other care team members. While Morris-Singer, himself a primary care physician, says his work has never been motivated by patients' letters, "gratitude from patients is a piece of the puzzle."

Morris-Singer focuses much of his work on the problem of physician burnout, and he says patient letters have a role to play in solving that problem.

"The silver lining in the epidemic of physician burnout is that it's forcing us as a community to have a conversation about the psychological, sociological, and behavioral needs of health professionals," says Morris-Singer. "Doctors are not machines or robots who wear suits of armor. They're people. And they have needs."

With that in mind, Morris-Singer wishes more physicians would admit that they want to have their work acknowledged.

"You're not supposed to say that you need someone to thank you because that's 'emotionally needy,'" he says. "But deep down we all have the need for others to appreciate us and our work."

Nevertheless, Morris-Singer doesn't put the burden of gratitude squarely on the patient.

"I believe that gratitude from patients and from colleagues, and an increasing sense of gratitude from systems are going to be required to help pull health professionals out of the accelerating burnout spiral that we're in," he says.

When I spoke to Morris-Singer, I began to think beyond secret manila folders and about my own career as both a physician and leader of CareMore Health, a progressive health care system. Truth be told, on the management side of the work I do, nothing makes me feel better than a letter of thanks or an acknowledgement of good work from a member of my team.

It turns out I'm not the only one who feels this way.

"I think the key is gratitude within the entire work environment," says UCLA's Kerbel. "Collegial gratitude is what supports a positive work environment."

Someone else who feels this way? My dad. He recently retired from his decades-long anesthesiology practice. When I went by his house the other day, he had a wide grin on his face. He couldn't wait to show me a letter he'd received from a surgeon he'd spent countless hours with in the OR.

"I recall how creative and dedicated you were to solving the most difficult patient problems," wrote my father's colleague. "From the surgeons' perspective, we always were reassured when you were on the case."

Some of the doctors I spoke with said they were less focused on the gratitude their patients feel for them than the gratitude they feel for their patients. Oriol, for example, told me, "Our sense of gratitude comes from the opportunity to play a significant role in this other human's life."

To illustrate, Oriol recounts a situation involving a patient whose life she helped save while she was an attending obstetric anesthesiologist at Beth Israel Deaconess Medical Center. During delivery, the patient had developed a life-threatening amniotic-fluid embolism.

"The sense of gratitude I felt for her living was awesome," says Oriol.

Similarly, when Katz gets letters from grateful patients, he forwards them to the residents who treated them. It's the residents, he says, who tend to create what might be considered a gratitude feedback loop. "Uniformly they say 'I'm glad I was able to help this person and glad I was able to learn from this patient,'" says Katz.

With this in mind, Katz often replies to letters by thanking the patients who wrote them.

"Patients are vital to our education programs," says Katz, who often suggests ways that patients can learn more about the crucial role they play in the training of physicians.

Cursive grace

After having so many thoughtful conversations with my fellow physicians, I once again considered all those pastries my father's patients sent him. Ultimately, I don't think those cakes were expressions of gratitude. They were expressions of connectedness.

La Quaglia told me that patient letters had less to do with gratitude than patient care itself. "It's caught up in trying to develop a strong bond with your patient," he says.

He's always pleased when he gets letters of any kind from his patients because, he says, "In any human endeavor, I think people are always happy to be told that they've made a difference, and they've impacted a life."


In a recent *New York Times* column, Mikkael Sekeres, a hematologist and oncologist at the Cleveland Clinic, confessed that he couldn't bring himself to throw his patients' letters away because of what those letters represent.

"It's almost like a part of the person I cared for, and it seems callous to discard it," he wrote.

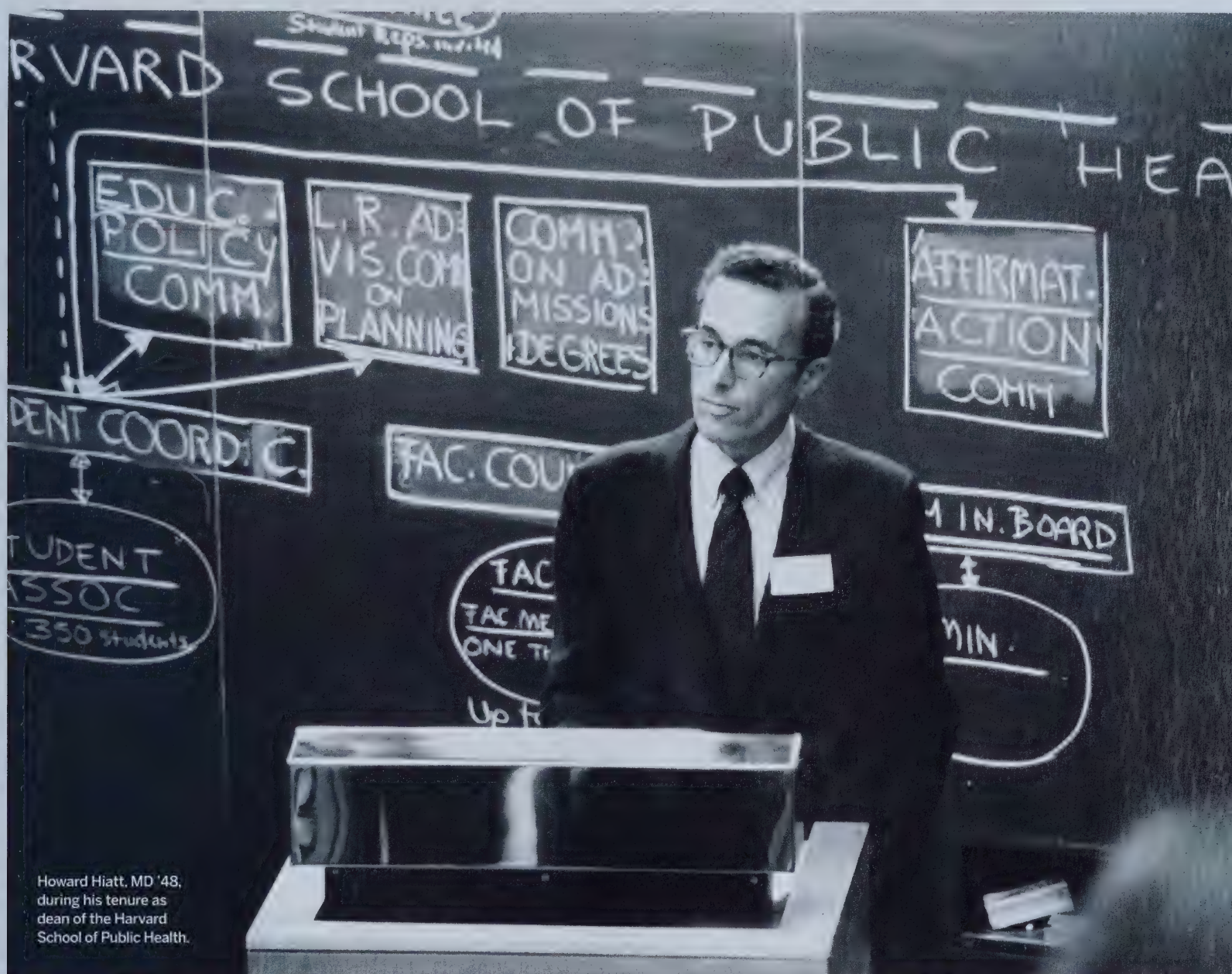
Medicine is a fast-changing field, and we all feel a certain anxiety about it these days. But what uniformly inspired us to enter the field was our desire to form connections—with our patients, our colleagues, and everyone else we encounter every day in the course of doing our jobs.

It seems to me that one of the least costly ways to honor those connections and make them stronger is to show appreciation.

Understanding that, from now on I won't just be saving letters.

I'll be writing them, too. 

Sachin Jain, MD '08, is an adjunct professor of medicine at Stanford University School of Medicine and president and CEO of the CareMore Health System, a health care delivery organization.

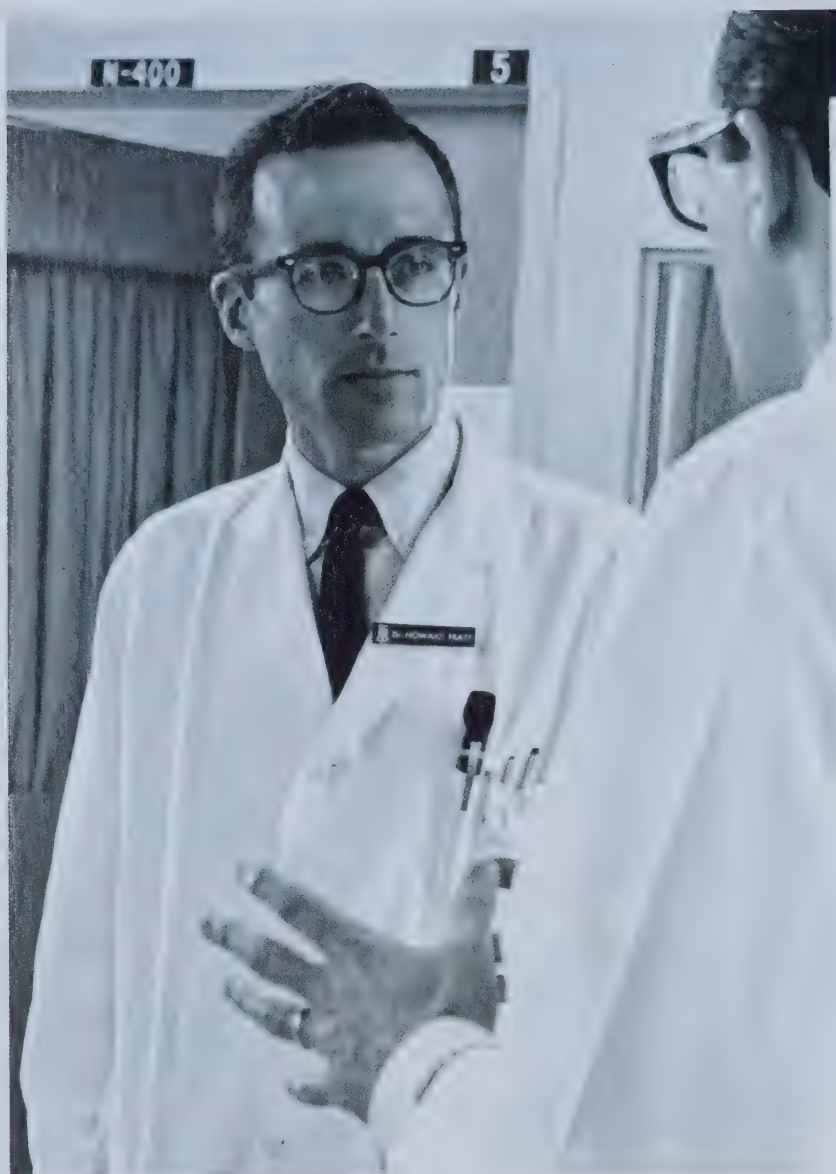


Howard Hiatt, MD '48, during his tenure as dean of the Harvard School of Public Health.

game changer

An edited excerpt from *Howard Hiatt: How This Extraordinary Mentor Transformed Health with Science and Compassion* by Mark Rosenberg, The MIT Press, 2018

CHANGE IS OFTEN DIFFICULT in medicine, particularly when it involves making changes to department leadership roles. Tenured medical faculty members sometimes have a tendency to become entrenched through the years and resist anything different from what they are accustomed to. Through happenstance, however, a number of chiefs of services at Beth Israel Hospital were arriving at retirement age just as Howard Hiatt was taking over as chief of medicine. Thus, he was in a position to appoint new chiefs and to do so, in most cases, without internal conflict.



During his initial years as chief of medicine, the staff of Beth Israel as well as its board greeted his changes with enthusiasm. He was professional and knowledgeable, but he was also the kind of person to whom others are drawn. There was a charisma to Howard that helped make changes more acceptable to people. Other physicians, students, administrators, board members, and patients saw Howard with his smile and his easy, avuncular manner. He asked about staff members' families and he did so remembering people's names and the names and ages of their kids. He was a rigorous manager but an essential aspect of his management was to connect to people on a human level with warmth, collegiality, and often humor. His self-deprecating brand of off-the-cuff humor became one of his most appealing traits throughout the medical center.

As he worked his way through changes in the early days of his new role, Howard sought the advice of a number of friends and colleagues. In particular, he consulted Dr. Walter Bauer, chairman of the Department of Medicine at Mass General, who had selected excellent young doctors and sent a number of them to

Hiatt and a colleague at Beth Israel, where Hiatt served as the physician-in-chief from 1963 to 1972.

NIH for additional training before having them return to Mass General. Given Howard's interest in research, this approach very much appealed to him and he would follow this model at the BI. "I looked for people who were accomplished clinically and very sophisticated scientifically and this was quite unusual," says Howard. A number of well-respected physicians at Beth Israel criticized Howard for this approach, arguing that the goal should be attracting superb clinicians regardless of their research interests or ability. All attention was owed to patients and their ailments, these people argued. But Howard said it was important to take a broader view and that people who were both excellent physicians and accomplished researchers were more likely to identify the best treatments for patients.

As much as Howard loved his work at Beth Israel, he sometimes yearned to get back into the research laboratory. He had experienced the elation of success in the lab years earlier in his work on messenger RNA. There was no feeling quite like the sense of accomplishment that came with breaking new scientific ground. After five years as chief of medicine, with a strong team in place at Beth Israel, he decided the time was right to take a year's sabbatical and immerse himself in the lab. He felt instinctively that it would be impractical to do this in Boston—he knew that if he were on the BI property he would repeatedly be drawn into a wide variety of issues, meetings, decisions to be made. Thus, he took an opportunity to travel to Great Britain to work under a renowned cell biologist at the Imperial Cancer Research Fund Laboratory at Lincoln's Inn Fields in London, one of the world's leading cancer research centers. Howard learned a great deal during his time working with the research scientists. His understanding of cancer deepened considerably.

His work in London also gave him an opportunity to become reacquainted with Dr. Brian Jarman, a general practitioner with a panel of patients mainly in a poor area of London. Many mornings, from nine to eleven, he would make house calls. The devotion to serving needy patients that Jarman brought to the work was clear. Beyond that, Howard was struck by the power of Jarman's intellect. Jarman's preparation for medicine had been quite unusual to say the least. He earned a PhD in geophysics at Cambridge and started out his professional career exploring the Sahara and other deserts for an oil company.

What began as a professional relationship between Howard and Jarman evolved into a close friendship between the two men that would stretch over almost six decades. Jarman would go on to become one of the leading primary care physicians in the United Kingdom, head of the Royal College of General Practitioners, and president of the British Medical Association.

The most lasting benefit for Howard from the year in London, in addition to his friendship with Brian, was the opportunity to see the delivery of ambulatory care by the men and women of the British National Health Service. Primary care was Jarman's specialty,

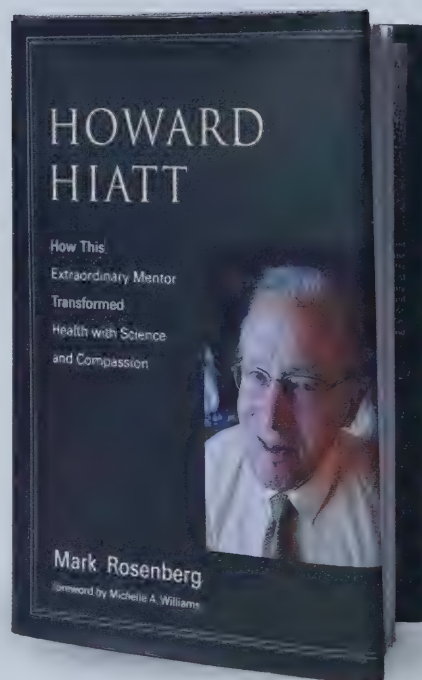
and he guided Howard through the delivery system with a sense of mission and pride. Howard spent time with Jarman in inner-city London at a clinic serving many working and poor people. He also accompanied Brian on house calls. This effort on the part of Jarman and other NHS physicians to reach out and connect with people in need either through home or clinic visits impressed Howard. There was nothing like this at Beth Israel Hospital.

Thus did Howard become “aware of how much our Department of Medicine and American academic medicine in general were not doing, both internally within the hospitals and in surrounding neighborhoods.” The National Health Service delivered care to any and all people regardless of their income or social standing and doing so in a setting convenient to the patient left an indelible mark.

Howard returned from London in 1970 with the images of the work he had observed Jarman doing fresh in his mind. He was determined that Beth Israel must do more to provide care to people in need within poor areas of the city of Boston. He also was determined to change the way care was delivered as well as the way the faculty was teaching medical students and residents. This was new ground. Medicine at the time was centered upon treating patients first and foremost and, only then, researching new treatments. Rarely did physicians talk about ways of improving the delivery of care or even what that delivery process should look like. There were standard models—one for ambulatory care and one for in-patient care—and rare was the deviation from these models.

In 1969, while Howard was in London, a radical new experiment in care delivery was launched by a team led by Dr. Robert Ebert, dean of Harvard Medical School. Ebert and his colleagues believed that the best way to deliver care would be through what he called a health maintenance organization (HMO): a group of physicians and other caregivers whose mission would be to keep its members healthy through prevention and early intervention and to provide excellent treatment to those members when they became sick. This HMO model was designed as well to provide care at a lower cost than traditional health insurance plans. Harvard funded this not-for-profit venture, which opened its doors in 1969. From the start, Harvard Community Health Plan attracted talented, idealistic doctors, but its initial efforts to attract subscription-paying members did not fare particularly well. At the start, a grand total of eighty-eight people signed up. Over time, however, the plan flourished.

Ebert also wished to link the new initiative to Harvard teaching hospitals, which Howard thought made perfect sense. Harvard Community Health Plan was unusual for many reasons, not the least of which was its experimental nature. Medicine was then and remains today a conservative profession. Change in healthcare organizations ... can be both slow and painful. There is often a



predisposition among powerful people in health-care—including many doctors—to reflexively resist change. Howard recognized, however, that the largely hospital-based model of care was insufficient to meet the needs of many patients in a variety of parts of the community. “What was needed,” Howard observed in his memoir, “was a capability within our Department of Medicine to study existing patterns of primary care: How was our society delivering care to people whose medical needs did not require hospitalization?”

The result of all this was the creation of the Beth Israel Ambulatory Care program, which connected patients with a primary care physician and provided ongoing care to patients via an ambulatory care center at the hospital. Howard was guided and inspired in this work by what he had seen in London. Beyond the ambulatory care center and mindful of Jarman’s work in London, Howard established a relationship between Beth Israel and

Dimock Community Health Center in the Roxbury neighborhood of Boston. This was a largely black neighborhood with a good deal of poverty and many health challenges ranging from chronic diseases to gun violence.

Howard was so taken by the work Jarman was doing that he later wrote a column that was published on the op-ed page of the *New York Times* (November 16, 1991) entitled “Meet Dr. Jarman. He makes house calls.” The article contrasted the efficiency of the National Health Service with the wasteful nature of delivery in the United States (recounting the story of an elderly man who wanted very much to remain home but who was hospitalized for a series of tests that proved to be not at all helpful medically but nonetheless very expensive). Howard wrote that “Dr. Jarman says that in England ... the continuity of care by general practitioners ... means more prevention and fewer unnecessary procedures, hospitalizations, visits to consultants and costs.”

Primary care could do so much more to improve care and control costs but in the United States just 25 percent of physicians are in primary care, while in the UK it is half of all doctors, where their income is on a par with that of heart or brain surgeons. The relationship between primary care doctor and patient is central to the ability of caregivers in the UK to provide ongoing care responsive to patients’ overall needs. ■■

Mark Rosenberg, MD ’72, is a faculty member at Emory University’s schools of medicine and public health. He served as president and CEO of the Task Force for Global Health and served for twenty years at the Centers for Disease Control and Prevention, where he oversaw research on gun violence before the enactment of the Dickey Amendment.





JOHN SOARES

Student Life

Troy Ameen

TROY AMEEN HAS SET HIS SIGHTS on becoming a surgical administrator, a profession he thinks will well prepare him to one day run an urban hospital. In such a position, this rising fourth-year medical student and first-year MBA candidate says he would effect change both small and large: improving how operating rooms function, and "instituting changes from an administrative perspective" that would address socioeconomic inequalities. All with the goal of changing how health care is delivered.

A native of Tallahassee, Florida, Ameen knows firsthand about the health, educational, and racial disparities exacerbated by poverty.

"All the things you don't associate with a Harvard Med student, I have seen and lived through," he says, telling of close family members who have struggled with preventable infectious diseases, incarceration, or drug overdose, or of the 75 percent of his classmates who did not go on to college after high school.

Ameen has spent much of his time in college working to change the social status quo. While an undergraduate at Columbia University, he worked in Harlem, teaching in public high schools, helping in an emergency room, and founding a volunteer program that provided social and academic support for families in the Morning-side Heights neighborhood. After college, he taught high school biology for a year in Chicago.

At HMS, Ameen founded Hope Medical Scholars, which has brought more than one hundred high school students, many of whom would be the first in their family to attend college, to HMS for a three-day immersion program.

Ameen says he has a natural inclination for business. At Columbia, he ran a campus laundry service and managed a stock portfolio in a student-run investment group. He even paid some of his tuition by trading his own stocks.

This fall, Ameen will begin classes at Harvard Business School, where he says he hopes to strengthen the financial, analytical, and leadership skills that will help him understand how to work within the current health care system and manage administrative pressures, such as physician workload, financial constraints, insurance regulations, and policy decisions. —Bobbie Collins





Claire Wagner

IN PURSUING HER JOINT DEGREE from Harvard's medical and business schools, Claire Wagner, a rising fourth-year medical student and a first-year MBA candidate, says both institutions have allowed her to advance and hone what she says is "a combination of two ways of thinking."

"One is curiosity," she says. Both degree programs have trained her to look for, and act on, opportunities, whether they be business pursuits or scientific discoveries.

"The other," she adds, "is caution and vigilance," which she says entails exercising due diligence before embarking on a new effort, whether analyzing investments, running multinational studies, planning treatment for a patient, or launching a start-up, which she and a classmate did in 2019.

Wagner, who has ten years of experience working in the global health arena, says she feels that both programs have equipped her "to tackle big problems in health care."

A childhood spent partly overseas with parents who work in international development established her interest in the wider world. Working abroad during her undergraduate years at Dartmouth College showed her "how intertwined health and illness are with poverty" and cemented an interest in health.

She then served for several years as a research fellow to Agnes Bingawaho, the minister of health for Rwanda, and to Paul Farmer, MD '90 PhD '90, the Kolokotronis University Professor of Global Health and Social Medicine at Harvard. She later worked with leadership at the Dana-Farber Cancer Institute and the World Health Organization on a high-impact effort to improve access to cancer medicines globally.

Wagner says knowing how to articulate an opinion and argue a position are crucial skills, ones she developed as a speechwriter and as an author on more than forty scientific articles. Those skills are now being refined through MBA coursework and patient care.

Although she acknowledges that each school encourages trainees to analyze situations through different lenses and with different tools, she does not consider the approaches to be incompatible. Instead, she insists there is much to gain by integrating the two. For example, as principal investigator on a six-country study, Wagner is combining her skills in clinical investigation with market research to evaluate access to cancer biopsy devices in East Africa.

With her dual degree, Wagner plans to continue her work in health care delivery and her career in improving access to medicine and technologies.

—Bobbie Collins

Mark Zaki

LIKE MANY MEDICAL STUDENTS, Mark Zaki became interested in medicine because of an illness that befell a family member. His grandfather, being treated for idiopathic pulmonary fibrosis, underwent a successful double-lung transplant and fully recovered in three months. Then, two years later, his grandfather died from another condition: pancreatic cancer.

"I got to see the glamorous and heroic aspects of medicine but also the realistic and limited aspects of it as well," says Zaki, a rising fourth-year student and first-year MBA candidate. "Throughout the experience, I learned a lot about the importance of connecting on a human level with patients."

The importance of connection was furthered during Zaki's years as an undergraduate at the University of Pittsburgh. While there, he worked as a tutor with a family of Somali refugees. Deeper conversations, he found, took place outside the classroom.

"One girl in the family started asking me about drug issues," he recalls. "If I had only focused on the algebra and grammar associated with their homework assignments, I'd have missed such a core component of their story, their background, and how it influences their lives."

After arriving at HMS, Zaki wanted to continue working with families in need, but couldn't find an opportunity similar to the one he'd had in Pittsburgh. He discovered that certain of his classmates had also tutored children—and wished to continue. He developed an idea for a program that would bring HMS student together with students in a school in Mission Hill, a neighboring community.

That idea became the Mission Crimson program, now heading into its fourth year. Although some measure success in terms of accolades, program tutors measure their success in relationships shared with the students themselves. When an HMS tutor couldn't be present one day, his student refused to work with anyone else. The tutor, he said, was like his big brother.

"To hear one of the middle-school students say something like that," says Zaki, "really gives perspective."

In the summer of 2018, Zaki traveled to Zambia for medical service. While there, Zaki realized that poor infrastructure was the main barrier to accessing medical care.

"If the roads weren't paved or there wasn't a functioning ambulance to get a patient to an appropriate health care setting, they couldn't receive care."

He realized that delivering proper health care meant understanding the entire health care environment, including stakeholders and financiers. It was a realization that led him to seek an MBA in addition to an MD.

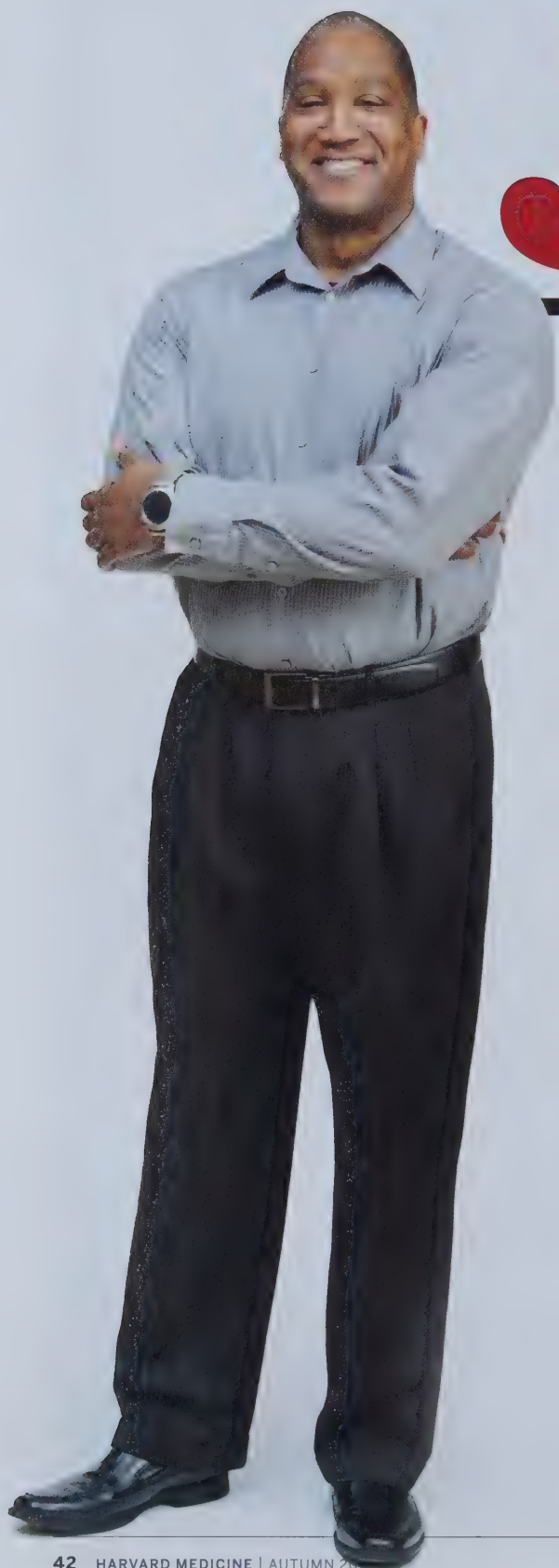
—Pratibha Gopalakrishna





in 5

A conversation with Darren Higgins, professor of microbiology in the Blavatnik Institute at Harvard Medical School



What drew you to studying how bacteria invade cells and cause disease?

I am fascinated by the fact that microorganisms we can't even see with the naked eye can cause so much death and disease in so many different ways.

Who has influenced your career?

There have been a few. My PhD adviser Victor DiRita, now chair of microbiology and molecular genetics at Michigan State, was formative for my development and, in many ways, continues to be. Then there was Dan Portnoy, my postdoctoral adviser at UC Berkeley, who taught me not only how to be a better scientist but how to be a better person. He taught me that in life, but especially in science, one has to be gracious and be generous.

What was your most memorable eureka moment?

One of the major challenges in vaccine development is making vaccines that can stimulate both arms of the adaptive immune system—antibodies and T cells.

As a postdoc, I was working on a technology that could express and target every protein from an infectious pathogen for delivery into host cells for presentation to T cells. If we could do this, then we could rapidly identify which proteins would be the appropriate components to make vaccines better at stimulating T cell immune response. But the technology just wasn't working.

Then I realized we had a Goldilocks problem: too much of one of the delivery system's components killed the cell; too little failed to trigger any T cell response. We finally got to the sweet spot. The system, ATLAS, is now being used commercially to develop vaccines for cancer.

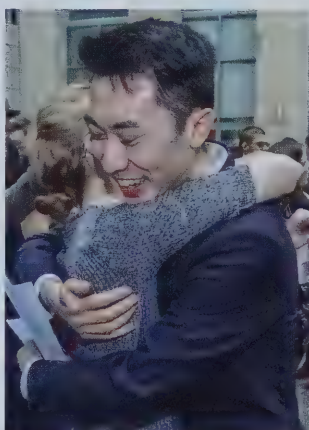
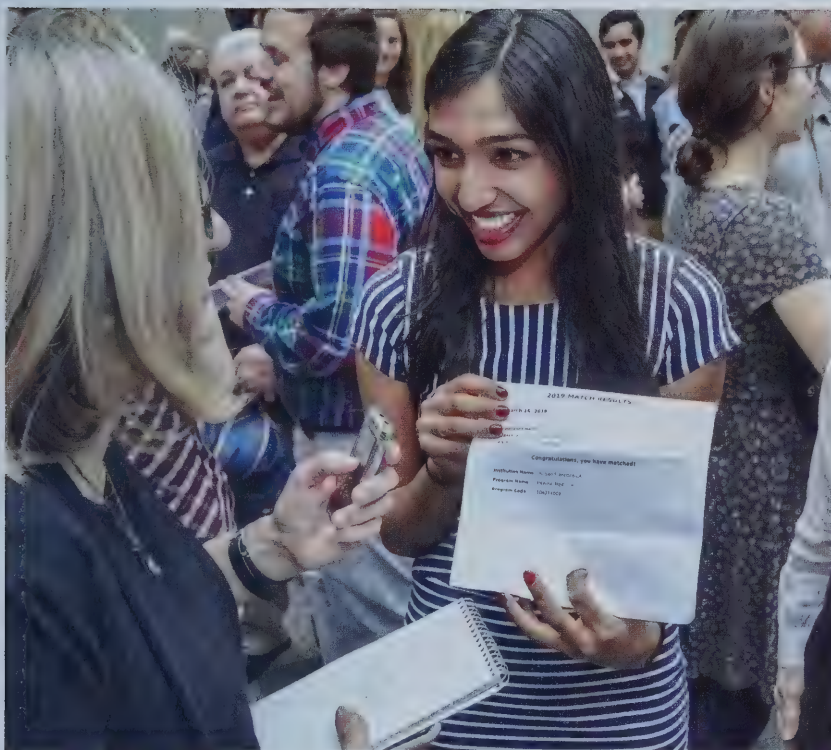
How do you stay curious?

I like to solve problems. I like to build things. Kids do this naturally. One time, I was walking with my twin daughters—they were 3 or 4 at the time—and one of them stopped to look at a flower. As I tried to hurry her along, it hit me: we adults get so fixated on the need to get things done that we forget to focus on the basic details and ask the right questions. In every facet of my life, I phrase things in the form of a question. If you ask questions instead of just making statements, the dialogue is much better.

What are the most daunting challenges in the field of infectious diseases?

By 2050, infectious diseases will kill more people than cancer, partly due to antibiotic resistance and partly due to the resurgence of old diseases and the emergence of new pathogens. There's a dire need for new therapies, but also for new prevention strategies. Another aspect, of course, is social acceptance of vaccines, especially the timing of prophylactic vaccines for children, and combating vaccine hesitancy. Public education and public engagement are critical.

—Ekaterina Pesheva



Match List 2019

ANESTHESIOLOGY

Laura Banashek
Massachusetts
General Hospital

Gabriel Fregoso
Massachusetts
General Hospital

Nicolas Govea
New York-Presbyte-
rian Hospital/Weill
Cornell Medical
Center

Dustin Griesemer
Brigham and
Women's Hospital

Henry Su
Massachusetts
General Hospital

Carmen Zhou
Beth Israel Deacon-
ess Medical Center

DERMATOLOGY

Soraya Azzawi
University of Miami/
Jackson Memorial
Hospital

Jonathan Fisher
UCLA Medical
Center

Dayan Li
Stanford University
Programs

Jonathan Webster
Indiana University
School of Medicine

EMERGENCY MEDICINE

Yosef Berlyand
Massachusetts
General Hospital

Agatha Brzezinski
UCLA Medical
Center

Kyle Burton
Johns Hopkins
Hospital

Keenan Mahan
Massachusetts
General Hospital

Benjamin Mormann
Massachusetts
General Hospital

**Cassandra
Peitzman**
Massachusetts
General Hospital

My Tuyet Tran
Alameda Health
Systems

Octavio Viramontes
Alameda Health
Systems

Kara Yeung
Massachusetts
General Hospital

FAMILY MEDICINE

Megan Townsend
University of
Colorado School of
Medicine

GENERAL SURGERY

Neil Blok
University of
Michigan Hospital

Abraham Geller
Massachusetts
General Hospital

Nicole Goldhaber
San Diego Medical
Center

Susan Kuo
Cedars-Sinai
Medical Center

Samantha Landino
Massachusetts
General Hospital

Deanna Palenzuela
Massachusetts
General Hospital

Lauren Schleimer
New York-Presbyte-
rian Hospital/
Columbia University
Medical Center

Kathy Wang
University of Illinois/
Metropolitan Group
Hospitals

Mark Yost
UCLA Medical
Center

Biqi Zhang
Brigham and
Women's Hospital

INTERNAL MEDICINE

Amir Ameri
Johns Hopkins
Hospital

**Annabelle Anan-
dappa**
Massachusetts
General Hospital

Vishal Arora
Brigham and
Women's Hospital

David Bozym
Massachusetts
General Hospital

Kia Byrd
University of Texas
Southwestern
Medical School

Dana Callahan
Brigham and
Women's Hospital

Allison Chang
Brigham and
Women's Hospital

Michael Chilazi
Johns Hopkins
Hospital

Mai Dao
University of California
San Francisco

Michael Dilorio
Brigham and
Women's Hospital

Ryan Din
NYU School of
Medicine

Ershela Duresi
NYU School of
Medicine

Alyssa Ehrlich
Stanford University
Programs

Smitha Ganeshan
University of California
San Francisco

Jingyi Gong
Brigham and
Women's Hospital

Dan Gui
Brigham and
Women's Hospital

Anand Habib
University of California
San Francisco

Robert Hayden
Brigham and
Women's Hospital

Jessica Holtzman
University of California
San Francisco

Michael Hughes
Johns Hopkins
Bayview

Joyce Hwang
Duke University
Medical Center

Manjinder Kandola
New York-Presbyterian
Hospital/Weill
Cornell Medical
Center

Margaret Krasne
Johns Hopkins
Hospital

Vipul Kumar
University of California
San Francisco

Arielle Kushman
New York-Presbyterian
Hospital/Weill
Cornell Medical
Center

Brandon Law
Johns Hopkins
Hospital

David Lee
Massachusetts
General Hospital

Krystle Leung
Massachusetts
General Hospital

Jingyi Liu
Stanford University
Programs

Vivian Liu
University of
Washington Affiliate
Hospital

Rahul Nayak
Massachusetts
General Hospital

Cameron Nutt
Brigham and
Women's Hospital

Christine Santiago
Stanford University
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General Hospital

Alykhan Shamji
Massachusetts
General Hospital

Krishan Sharma
Massachusetts
General Hospital

Jenny Shih
Beth Israel Deaconess
Medical Center

Quinlan Sievers
University of California
San Francisco

Benjamin Steinhorn
Massachusetts
General Hospital

Jessica Stuart
Brigham and
Women's Hospital

Darshali Vyas
Massachusetts
General Hospital

Jeremiah Wala
University of California
San Francisco

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General Hospital

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Vanderbilt University
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Icahn School of
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Sinai

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Medicine

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Women's Hospital

Alison Holliday
Brigham and
Women's Hospital

Sanjay Kishore
Brigham and
Women's Hospital

Pooja Mehta
Brigham and
Women's Hospital

Anna Morenz
University of Washington
Affiliate
Hospital

Vishwajith Sridharan
Massachusetts
General Hospital

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Brigham and
Women's Hospital

Maya Harary
UCLA Medical
Center

**Alexandra Giantini
Larsen**
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Hospital/Weill
Cornell Medical
Center

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General Hospital

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St. Joseph's Hospital,
Phoenix, Arizona

Michael Silva
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Hospital

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General Hospital

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of Philadelphia

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Brigham and
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Johns Hopkins
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Loza**
Brigham and
Women's Hospital

Vihang Nakhate
Brigham and
Women's Hospital

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Stanford University
Programs



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Matthew Young
Christiana Care-
Delaware

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Daniel Ceasar
NYU School of
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Johns Hopkins/
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Michigan Hospital

Daniel Liebman
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and Ear

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Stanford University

Marissa Shoji
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Bascom Palmer



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Massachusetts
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Sukijthamapan**
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Washington, DC

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Hospital

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Sundaram**
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nia San Francisco

Zhi-Yang Tsun
University of Roch-
ester/Strong
Memorial Hospital

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Massachusetts
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Hospital

Alicia Smart
Massachusetts
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Eugene Vaio
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Brigham and
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Cornell Medical
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Beth Israel Deacon-
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McKinsey &
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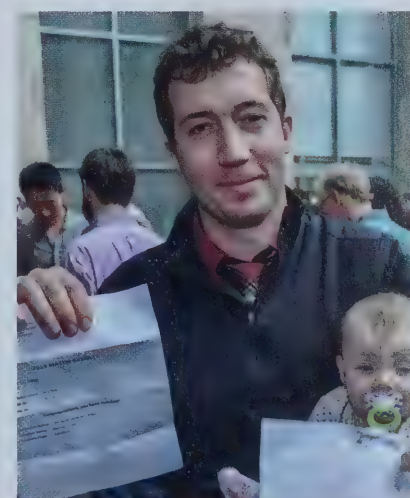
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Hospital

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Massachusetts
General Hospital

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Massachusetts
General Hospital



Trial Effort

MULLING OVER HOW TO APPLY QUANTITATIVE ANALYSIS to medicine may not be everyone's cup of tea, but Deborah Zarin's interest was piqued while she was a medical student working with faculty applying decision analysis to medicine at what was then the Harvard School of Public Health. The experience, she says, gave her a framework for thinking about how clinical decisions are made: "If a patient has an indication for a certain drug but also a contraindication for the same drug how would you decide whether they get that drug? What is the optimal decision for that patient?"

Following HMS and a year of training in pediatrics, Zarin completed a clinical decision-making fellowship. That fellowship led her to take the job of founding director of practice guidelines at the American Psychiatric Association. In 2005, she was hired by the National Library of Medicine as director of ClinicalTrials.gov, the trial registration tool launched in 2000. In this role, she took trial registration from niche to standard practice and helped make researchers more accountable for their data and documentation.

Zarin's appointment closely coincided with the implementation of the International Committee of Medical Journal Editors' requirement that, in order for a research paper to appear in member journals, the clinical trial it reports would need be registered in a public database. The number of trials registered in the weeks after the requirement went into effect skyrocketed, from 25 per week to 1,000 in a day, settling at more than 500 per week.

She recalls her years at ClinicalTrials.gov as a time devoted to keeping the database running while implementing a flurry of policies, including the 2007 law passed by Congress that expanded the types of trials requiring registration and added the reporting of summary results, including adverse events.

Zarin is proud of having helped change the way clinical trial results are reported. The project allowed for greater transparency and accountability of study design and ultimately improved data for clinical decision making.

Now, at HMS, Zarin is program director in the Multi-Regional Clinical Trial Center of Brigham and Women's Hospital and Harvard University. She sees this as a chance to take her work on clinical trial reporting to the next logical step: advancing the quality of the clinical research enterprise. —Susan Karcz

Deborah Zarin, MD '81 | Program Director, Multi-Regional Clinical Trial Center | Brigham and Women's Hospital and Harvard University | former director of ClinicalTrials.gov | National Library of Medicine



Beth Israel Hospital, circa 1980

In It for Good

A physician posits ways to keep the profession true to itself

DURING MY SURGERY CLERKSHIP AT BETH ISRAEL HOSPITAL, a clinical faculty member said to me, "Be good to medicine, and medicine will be good to you."

I thought I knew what he was saying, but with the years, I've developed a deeper perspective.

Medicine is a noble profession guided by certain tenets, among them the Hippocratic oath, which has remained relevant for the past 2,400 years. Practice with humility and with empathy, always put the interest of the patient first, never break confidences.

The faculty member was instructing me to respect medicine.

By respecting medicine, medicine will provide rewards—not just financial security and professional standing but deep career satisfaction.

You may be somewhat skeptical about the latter point and note the physician burnout phenomenon and the increasing suicide rate among physicians.

I recognize this situation. The Physicians Foundation, in its 2018 *Survey of America's Physicians*, reported that less than one-half of doctors reported they were satisfied with their jobs, that three out of four felt some level of burnout, and that 62 percent were pessimistic about the future of medicine. These results are startling.

But I remain optimistic about medicine. This perspective is fueled not only by my love of medicine and the feeling of incredible privilege

I have to be a part of it but also by the realization that my path was atypical and not at all certain—that I was, perhaps, lucky.

My younger sister and I basically raised ourselves. Our parents were never around. Our mother was addicted to gambling, and our father to alcohol. We were subjected to experiences that no child should ever have to endure and, often, left to ourselves.

Neither of our parents had an opportunity to go to college. In fact, our mother had to leave school in the eighth grade to work and help support her adoptive family, and our father enlisted in the U.S. Navy immediately after high school.

I did not—and still do not—take for granted the opportunity I had to go to college and to medical school. At Harvard, no less.

I absolutely loved my time in medical school. To be able to look out into the future and know with certainty that I was going to have a career where I could positively impact people and also attain financial security was exhilarating.

However, I do understand that the practice of medicine has changed over the years and that there are many challenges to preserving aspects of medicine that we have historically cherished: the face-to-face interactions with patients, the ability to get to know them, and perhaps even to become a part of their lives; the relative autonomy we enjoyed in prioritizing patients' interests, relegating all other interests as secondary; and the trust enjoyed by physicians individually and by the profession collectively.

Throughout history, medicine has experienced challenges, even disruptions, that have shaken its very foundation. But this current time, this technological age, potentially poses the greatest threats medicine has yet faced: keystrokes are replacing eye contact and artificial intelligence and robotics are reshaping human-to-human relationships of all types and levels in health care. Compounding these threats is the pervasive and increasing distrust the public has of major societal sectors—including health care.

Guideposts

"Be good to medicine, and medicine will be good to you."

What exactly does this mean today?

During my years in medical school, I remember being inspired by the single word inscribed on the School's shield: Veritas. Truth.

The word continues to inspire me.

In this time of fake news, alternative facts, and an overall distrust of science among some, there cannot be any daylight between medicine and truth. Truth must be the primary driver for our biomedical research, must form the basis for our patient-doctor relationships, must guide what we teach our students of medicine.

Medicine also must remain mission-focused, not profit-focused.

I fully understand that sound business practices and decision making are necessary to the delivery of medical care. As the saying goes, "no money, no mission."

Without financial margins, the delivery of care to all who require it, as dictated by our Hippocratic oath, would be severely constrained. Current financial margins are thin, and health care delivery systems, partly to take advantage of economies of scale,

have been getting larger through mergers and acquisitions. To gain access to capital markets, it is likely that for-profit systems will proliferate in the future.

That in itself is not necessarily bad. However, profit for the sake of profit is anathema to medicine and undermines the public's trust.

Health care delivery systems, especially academic medical centers, have an obligation to serve their communities and invest in the public good.

To be good to medicine requires us to take a principled stand against profit as the primary driver of our health care delivery system—and as the primary motivation for our personal engagement in medicine.

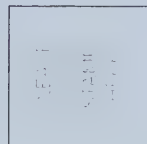




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DO NOT WRITE BELOW THIS LINE

To be good to medicine, we must steadfastly affirm our commitment to better health for our patients and our community as priority number one.

From three, one

Today, the arts and humanities are under siege, and some undergraduate curriculums have eliminated them altogether. Yet, medicine is both science and art.

In early 2018, the National Academies of Sciences, Engineering, and Medicine published the consensus study report, *The Integration of the Humanities and Arts with Sciences, Engineering, and Medicine in Higher Education*.

The opening paragraph of the report reads as follows:

"Albert Einstein once said, 'all religions, arts, and sciences are branches from the same tree.' This holistic view of all human knowledge and inquiry as fundamentally connected is reflected in the history of higher education—from the traditions of Socrates and Aristotle, to the era of industrialization, to the present day. This view holds that a broad and interwoven education is essential to the preparation of citizens for life, work, and civic participation. An educated and open mind empowers the individual to separate truth from falsehood, superstition and bias from fact, and logic from illogic."

I contend that today there is no discipline for which these sentiments are more important than medicine.

Many may agree that a focus on math and the sciences has overshadowed the arts and humanities as a foundation for the training of physicians. This emphasis is understandable. Science is a fundamentally important conceptual underpinning for medicine. But it is only one leg of a three-legged stool.

In 2011, the American Association of Medical Colleges (AAMC) published *Behavioral and Social Science Foundations for Future Physicians*. It noted that "a complete medical education must include, alongside the physical and biological sciences, the perspectives and findings that flow from the behavioral and social sciences."

Behavioral and social sciences: the second leg of the stool.

Currently, in collaboration with the National Endowment for the Humanities, the AAMC is developing a report that adds the arts and humanities as a third dimension that informs the work of a good health care practitioner.

I cannot overemphasize the importance of this third leg as a foundation of medicine and health care. In countries with modern medical technology, like the United States, health care systems are facing enormous difficulties in meeting demands such as distributing resources equitably and providing quality care to a large number of patients. Overlaid on these issues are the moral dimensions of how much care to provide to those who are terminally ill and to those who are unable to pay.

Addressing such challenges requires qualities of sympathy, empathy, compassion, patience, and caring—all implicit in humanism in medicine.

In 2007, the Institute for Healthcare Improvement introduced its triple-aim framework that set a goal of simultaneously improving the

We must steadfastly affirm our commitment to better health for our patients and our community as priority number one.

patient's experience of care, improving the health of populations, and reducing the per capita costs of health care.

Humanism positively affects all three goals. And, when considering physician dissatisfaction and burnout, recent research demonstrates that humanism in medicine supports a fourth aim: improving the work life of health care practitioners.

Being good to medicine means that despite the relentless advances of technology and science, we must embrace the arts and humanities as fundamental to the preparation of physicians and the preservation of humanism in our profession.

The picture of greatness

To be good to medicine, we also must ensure it can draw upon the talents of all segments of our diverse population. For me, this point is personal.

We must do more to ensure that all segments of the public are represented in our profession and that biases, even if unintended, do not systematically exclude persons of certain population groups.

Although it is encouraging that the proportion of women in our medical schools is now about 50 percent, more must be done to ensure that they have equal access to all the postgraduate training opportunities afforded men, that they are recognized equally for awards, that their pay is equal to that of their male counterparts, and that they are supported for advancement and promotion to the higher academic and administrative ranks.

In failing to ensure equality and respect, we are not being good to medicine. In fact, we cheat medicine.


One of the great strengths of our society has been the diversity of its people. Yet the goal of equity in medical education and training, particularly for our historically underrepresented populations, has been elusive.

Some of us in academic medicine feel we have succeeded if we have underrepresented populations enter primary care and practice in underserved communities. This is indeed laudable.

However, as a minority physician who specialized in the treatment of glaucoma, served on academic faculties, and held substantial roles leading medical schools, health science centers, and universities, I reject that definition of success.

We must make sure that underrepresented populations take part in all the wonderful opportunities afforded by medicine, whether in primary care or specialty care, administrative leadership or research.

Let's be good to medicine. Let's aspire to the ideal of veritas, stay true to our ages-old mission to heal and improve health, embrace the arts and humanities as a foundational element in the training of compassionate physicians, and recommit to achieving diversity and equity throughout the breadth of our profession.

If we do these things, medicine will be good to us. 

M. Roy Wilson, MD '80, is the president of Wayne State University. In 2018, while chair of the AAMC Board of Directors, he delivered an address titled "The Most Important Lesson I Learned in Medical School." This article is an edited version of that address.



Dea Angiolillo

On Call

First recipient of HMS alumni service award celebrated

DEAN GEORGE Q. DALEY, MD '91, considers it a mission-level priority for the School.

The School's Alumni Council even created an award acknowledging it.

"It" is service, the often selfless contributions to the welfare of others. And, for Dea Angiolillo, MD '79, service appears to be second nature.

Angiolillo is the inaugural recipient of the Distinguished Service Award for HMS Alumni, an award established by the Alumni Council as a means of recognizing and celebrating individuals who have made remarkable contributions to HMS.

After her selection, Daley called Angiolillo to congratulate her. He presented the award to Angiolillo on June 7 at the Harvard Medical

Alumni Association annual business meeting on Alumni Day during reunion. Coincidentally, 2019 marked 40 years since Angiolillo's class graduated, so many of her classmates were on hand for the presentation and celebration.

Angiolillo's award noted her quiet and dedicated commitment as a volunteer. For example, at HMS, Angiolillo created and continues to manage the MD Alumni Adviser program, an effort that connects students with alumni who are interested in providing career guidance on topics ranging from specialties to residencies, including helping with mock internship interviews. Currently, nearly 400 alumni participate as advisers. Between 2015 and 2018, one hundred students took part in this mentorship program.

Following her retirement a few years ago from a career in internal medicine at Harvard Vanguard Medical Associates in Wellesley, Massachusetts, Angiolillo became a volunteer medical worker at a free clinic for immigrants and the homeless in downtown Boston. She also has worked to set up a farm in western Massachusetts where disabled adults live and work.

Nomination criteria for the annual Distinguished Service Award for HMS Alumni include demonstrating an active commitment—through volunteerism, community engagement, consulting, or other actions—of support and exceptional service to HMS. Qualified alumni will have partnered with HMS administrators, faculty, students, or staff affiliated with one or more HMS office.

Alumni employed by HMS are eligible for the award provided they are not receiving compensation for the service submitted in their nomination. Alumni can submit nominations for the 2020 award online (<https://alumni.hms.harvard.edu/volunteer/service-award>); the deadline is December 31, 2019. The Alumni Council will select the recipient during its spring meeting.



DETAILS, UPDATES, AND OBSERVATIONS FROM ALUMNI

Physician burnout—emotional exhaustion or the loss of feeling that your work has meaning—appears to be a growing issue. **What advice would you give to a physician who may be experiencing burnout?**

“Maintain hobbies outside medicine, particularly if they involve moving your body.”

Victor Connell, MD '74

A healthy and enjoyable life should be a balance between work and some other interests. Set a reasonable limit on your workplace hours and make sure that your schedule allows enough time to get to know your regular patients and enjoy the art of practicing medicine. Make enough time outside of medicine for friends, family, and pursuing other interests. Maintain a healthy lifestyle, including regular exercise.

Marshall Ruffin, MD '78

I would tell that physician there are many ways in which she or he can use her or his skills, knowledge, and experience as a physician to find fulfillment in work. Try writing, consulting, or teaching. Take courses in health economics and health care business. Try working in administration or working for a business involved in health care. Health care involves one-fifth of the nation's economy. Surely there are many jobs of interest to a bright physician.

Stephen Friedland, MD '57

I would say that if you are financially secure, retire from practice and do something else in the universe of medicine; I still chair our hospital's ethics committee. Alternatively, do something entirely different, either as a volunteer or for remuneration. I would sincerely hope that you have some interests other than medicine.

William Ericson, MD '83

Say “no” to the things you know are not right. Set limits. Establish reasonable goals and expectations and, on a daily basis, try to eliminate the 20 percent of your life that causes the 80 percent of your grief.

Tamara Fountain, MD '88

Maintain hobbies outside medicine, particularly if they involve moving your body. Exercise and being outside are therapeutic in and of themselves. Volunteering and mission work can remind you of the joys that come with our profession. Being able to practice without the burden of EHR documentation, insurance clearance, and ungrateful, entitled patients with sky-high

expectations is a great antidote for what ails the U.S. health care delivery system.

As much as you can, control your work circumstances. Because many of us are increasingly employees, there is less and less of that control available, so try to carve out time away from your paying job. Pursue alone time and family time, maintain a hobby, maybe a pastime that you may have relinquished in your quest for professional fulfillment. These are the joys that a well-rounded life gives you. Unhealthy immersion in a stressful, increasingly toxic climate will take its toll.

David Fogelson, MD '77

Peer support is key. Take time to meet with your peers for clinical supervision; I have scheduled 90 minutes of peer supervision weekly. Your colleagues will help you develop a sense of mastery over difficult clinical cases. Take control of your schedule and give yourself time to listen to and treat the patient who is hurting; do not treat only the organ that is hurting. Stay in the present and focus on the case in hand, and don't fret over the next ten patients waiting to be seen.

Richard Peinert, MD '73

All the symposia on this advocate “me time” as the cure. Frankly, I think this is way off. The real cause of burnout, in my humble opinion, is that the “suits” in medicine don't care or even want to hear from the docs. Sadly, we abdicated power years ago. We have been marginalized and that is the real cause of burnout. The EMR is just another tool to keep us that way.

Samyukta Mullangi, MD '15

What you can let go, let go. What you can outsource, outsource. The key to having it all is understanding that you never will.

Gordon Bae, MD '16

We may not be able to change the demands of our work, but we can perform activities to decrease emotional exhaustion. These include exercising, eating well, sleeping well, journaling, meditating, practicing gratitude, developing deeper relationships, and decreasing screen time. Because of our responsibilities in our work and personal lives, not all of us can do all of this. But I think we can do one activity, even if it is just five minutes of exercise each morning.

But this is just one man's opinion.

Nathan Selden, MD '93

Work within a system that understands this problem, with other physicians and nurses who are committed to change, and in a culture that respects clinician wellness or is on the way to a meaningful change that you can be a part of. If you are not at such a place, you need to make a change.

Samuel Katz, MD '52

Burnout is not a problem for me. Enjoy your contact with others and your ability to help them. Slow down.

Richard Hirschhorn, MD '58

The physician should have other activities that have as much effect as his medical career.

Ernest Bergel, MD '56

Physician burnout is not a unitary disorder. Each case must be evaluated individually. There is, however, one urgent recommendation that I would give to the profession as a whole: Insist on a single, free, electronic health record system that all hospitals, clinics, and private practices must use. Then make it as hack proof as possible, since it will certainly be attacked.



Students and others on the HMS Quad, year unknown.

“You don’t have to be perfect, just be honest and share what is going on inside of you with another human being.”

Hugh Hermann, MD '54

If you are suffering burnout, it is your own fault for not balancing your life in medicine with sports, hobbies, and family.

Joseph Barr, MD '60

I’m 84 and not burned out yet, although if I had to live life over with all the rules and regulations that MDs now face, I probably would have burned out many years ago.

Brandon Lujan, MD '02

It’s balance, as always. Physician, heal thyself: physically, mentally, emotionally, and spiritually. You don’t have to be perfect, just be honest and share what is going on inside of you with another human being. You are not alone, whatever struggle you are facing. Breathe and focus on what works with gratitude.

Roy C. A. Weatherley-White, MD '58

Suck it up—you chose it. If you don’t like it, do something else, hopefully something equally worthwhile.

Mary Flowers, MD '78

Apply for a job in television, acting on *ER* or some other show and pretend to be a physician—more glamour, more money, more respect.

Joseph Burnett, MD '58

Switch research interests or go abroad.

Hena Ahmed Cheema, MD '18

My husband and I are both resident physicians. We were long distance our first year married and were both in very demanding training years (intern and PGY-4). We both, ironically, got a pet our first year of residency, and it has been the best protection against burnout. Having your spouse, closest family members, and best friends on speed dial doesn’t hurt, of course.

John Stanley, MD '58

I don't know what I'd say. I've never felt burned out but have often felt overworked. My advice is to take a long vacation.

Bruce Barnett, MD '75

Even the most gratifying work can be exhausting. Physicians should take enough time out to recover their physical and psychological strengths. A few weeks may suffice, but sometimes a tired physician needs to take a break from practice for many months or even a few years before returning to medicine with a fresh and energized perspective.

Carolyn Aldredge, MD '63

Continue to amend your practice to perhaps go in a different direction.

William Kupsy, MD '78

Become involved now in activities outside of work. Waiting until later may be too late.

Carl Needy, MD '49

I'd recommend going home to your wife earlier.

Richard Aadalen, MD '65

Continue to have time for and give time to your family, your spouse, and avocations that you enjoy.

Kaihi Fung, MD '82

Physicians can only do their best. God controls everyone's fate.

Kim Smith, MD '89

As a physician coach and champion for physician wellness, my advice to anyone experiencing burnout is to reach out to someone you trust. At all cost, avoid isolation. Look into resources and use them!

The causes of burnout are multifactorial. For most, burnout develops slowly and, more importantly, inconspicuously, like an insidious disease. The key is that it can be curable. Take action to find the solu-

tions needed for your health. It's time for us to become a priority as our own number one patient.

Lloyd Hamilton, MD '54

If you don't enjoy it, don't do it. American medicine has declined. It no longer puts the patient first. It is a money-making apparatus essentially run and governed by the insurance moguls, who are not, I can assure you, exactly philanthropic.

William Hood Jr., MD '58

I would recommend that the physician spend some time contemplating her or his good fortune at arriving at this stage of life and use that insight to stimulate interest in continuing on as before.

John Merrifield, MD '59

Talk to trusted people. Find another line of work; one of the strengths of medicine is that there are many different lines.

Donald Dillon, MD '59

In retrospect, I think seeking help (which I did, with a psychiatrist) is necessary, but also pondering ways to improve self-worth could be helpful before taking an abrupt action (as in retiring). Consider other ways in government, academia, or business employment.

Joseph McCabe, MD '74

Work a schedule that is not too stressful. Take time for yourself, make sure you are paying attention to personal relationships. If you are spending a lot of time feeling angry, see if there is something you can do to change the situation. If you can't change things, find a new position.

Exercise regularly. Take time to nourish your body and soul. Talk with colleagues about how you are feeling and what could be done to improve the situation.

Dick Dobrow, MD '62

I think burnout is a newer phenomenon, one that was not common when I was in practice. I would advise physicians to try to avoid medical systems that pile meaning-

less tasks on the physician and to try to be as independent as possible.

Samuel H. Kim, MD '62

Take a step back, focus on what bothers you the most, and adjust or eliminate.

Bartholomew Tortella, MD '80

Look within yourself to discern those things in medicine that, not so long ago, drew you to the profession, and put them back in your life. Give yourself permission to leave medicine if your inner spirit tells you that would contribute to helping people in a manner different from your current career.

Royce Moser Jr., MD '61

Do not despair! Trite, but true. I have often felt the same. Start remembering the productive times and a few actual lifesaving events.

David Dorsky, MD '82, PhD '82

You may have to change career tracks, at least slightly. There are so many ways that medical training and knowledge can be used. If you have to change tracks, think creatively and network extensively. I think that the keys to professional satisfaction are avoiding boredom and knowing that what you do has significance for others. Be curious. Find something that interests you and pursue it, even if you have to volunteer your time at first. Then, look for a niche in which you can make a difference.

Thank you to everyone who offered guidance—and perspective—on the issue of physician burnout.

The next issue of Harvard Medicine will feature your responses to the question: What were your thoughts when you first put on your white coat?

Responses can be submitted online: <https://hms.harvard.edu/rounds>; via email: hmsalum@hms.harvard.edu; by phone: 617-384-8520; or by mail: Rounds, Alumni Affairs and Development, Harvard Medical School, 401 Park Drive, Boston, MA 02115.

Obituaries

1940s

1947

Harold A. Braun, MD
March 20, 2019

Joaquin G. Cigarroa Jr., MD
March 9, 2019

Charles H. Lasley, MD
May 21, 2019

1949

Paul M. Brown, MD
March 1, 2019

John Reynolds, MD
March 27, 2019

1950s

1950

Mark S. Blumberg, MD
March 10, 2019

H. David Frank, MD
June 30, 2019

Kurt J. Isselbacher, MD
July 18, 2019

Edward W. Schoenheit Jr., MD
March 13, 2019

1951

Robert B. Boomer, MD
March 3, 2019

David B. Snow, MD
July 18, 2019

1952

Richard R. Curtin, MD
June 19, 2019

1953

Granville C. Coggs, MD
May 6, 2019

Dominick P. Purpura, MD
May 16, 2019

1954

Billy T. Collum, MD
April 9, 2019

Miles F. Shore, MD
June 20, 2019

1955

Edward C. Atwater, MD
April 27, 2019

1956

Robert A. Goodell Jr., MD
June 11, 2019

Albert D. Menno, MD
July 13, 2019

1957

Abbott R. Miller, MD
April 30, 2019

1958

Clarence L. Morgan, MD
July 14, 2019

1959

James K. Dixon, MD
June 15, 2019

1960s

1960

Elmer R. Pfefferkorn Jr., PhD
March 25, 2019

1961

George R. Delong, MD
July 10, 2019

James R. Hurd, MD
June 19, 2019

Bruce E. Zawacki, MD
May 25, 2019

1962

John P. Dixon, MD
June 2, 2019

1967

Temidowooluwa Ogunye, MD
June 25, 2019

1969

Richard N. Bail Jr., MD
May 29, 2019

1980s

1980

Sharon A. Clark, MD
June 1, 2019

1984

Paul A. Godley, MD
March 31, 2019

1990s

1997

Mona Lin Ridgeway, MD
July 8, 2019

This listing of deceased alumni includes those alumni whose notices of death were received between March 16 and July 26, 2019.



PRESIDENT'S REPORT

A Celebration of Our Progress



MY TWO-YEAR TERM AS PRESIDENT of the Harvard Medical Alumni Association ended in June. During my tenure, the Council focused on three major areas: diversity, idealism, and community, and aligned its work closely with the priorities of Dean George Q. Daley, MD '91. The Council's initiatives included:

- Adjusting HMS class affiliations to align alumni with the classmates they entered with, rather than the class they graduated with. The change, the result of a unanimous vote by the Council, took effect in the summer of 2018.

- Partnering with the Office of Educational Quality Improvement to

develop a survey of all MD alumni to inform a reaccreditation self-study for the Liaison Committee on Medical Education. We are grateful to all the alumni who helped us achieve a remarkable 27 percent participation rate. The data continue to be analyzed, and future surveys are planned in order to continually improve medical education at HMS.

- Developing an underrepresented-in-medicine gathering, launched at the 2018 reunion, for URiM alumni and students.

- Collaborating with the Office of Alumni Affairs and Development (AAD) to successfully increase young alumni engagement in reunion events.

- Partnering with the editor of *Harvard Medicine* magazine and AAD to establish a new magazine section, "Rounds," which asks alumni to respond to specific questions. The effort has increased alumni participation, especially among young alumni who had not previously contributed to the magazine.

- Establishing the Distinguished Service Award for Harvard Medical School Alumni, which recognizes the service of alumni. The inaugural award was presented to Dea Angiolillo, MD '79, at the Council's business meeting during the 2019 Reunion Week.

Our 2019 reunion weekend featured perfect June weather and record attendance, with more than 800 alumni and guests joining the School's Reunion and Alumni Day.

Alumni elected the following new Council members: Oni Blackstock, MD '05, New York City (third pentad); Tamara Callahan, MD '95, Louisville, Kentucky (vice president); Carmon Davis, MD '90, Boston (sixth pentad); Elizabeth Garner, MD '94, Bryn Mawr, Pennsylvania (councilor at large); and Nina Tolkoﬀ-Rubin, MD '68, Boston (tenth and beyond pentads). The Council appointed Erik Gaensler, MD '84, from San Francisco as chair of alumni giving, and Anthony "Tim" Russell, MD '74, from Boston, as graduate school director of the Harvard Alumni Association (HAA).

At our spring meeting, we celebrated and thanked retiring Council members Wanda Barfield, MD '90 (sixth pentad), Harold Burstein, MD '94, PhD '94 (graduate school director, HAA), Jennifer Chen, MD '09 (councilor at large), Tamara Fountain, MD '88 (chair of alumni giving), Nancy Oriol, MD '79 (vice president), Fidencio Saldaña, MD '01 (third pentad), and Marshall Wolf, MD '63 (tenth pentad).

During the past two years, it has been my privilege to serve alongside Dean Daley as he began his leadership of HMS. As I turn the presidency of the Council over to my colleague Michael Rosenblatt, MD '73, I know that we are in good hands.

The vibrancy, intensity, and commitment of our alumni community to improving health is simply stunning. Throughout the School, regardless of the topic being discussed or who is having the discussion, the question always becomes: What data do we need to do this better? Our brilliant, creative, and passionate students are being prepared to tackle the hardest questions. The future of medicine is very bright.

Elizabeth (Lisa) Petri Henske, MD '85, is an HMS professor of medicine at Brigham and Women's Hospital, director of the Center for LAM Research and Clinical Care at Brigham and Women's, director of the Brigham Research Institute, associate member of the Broad Institute of MIT and Harvard, and a medical oncologist at the Lank Center for Genitourinary Oncology at the Dana-Farber Cancer Institute.

Alumni Announcements

50 Years of Diversity and Inclusion at HMS and HSDM

Join us on October 28 to celebrate the anniversary of the 1969 diversity initiative that paved the way for a culture of inclusion at HMS and beyond. Alumni, faculty, trainees, students, and staff will gather for a day of reflection and looking forward. Learn more and register at hms.harvard.edu/diversity50.

AAMC Alumni Reception

If you are planning to attend the Association of American Medical Colleges' signature learning and networking event in Phoenix, Arizona, please join us for an alumni reception Nov. 10 from 6:15 to 7:30 p.m. After the reception, you are invited to join David Roberts, MD '95, HMS dean for external education, for dinner, discussion, and a chance to hear about the School's online learning program, HMX. Additional details will be emailed to alumni beginning in September.

Alumni Benefits

We encourage you to take advantage of the many resources and opportunities available to alumni, including on-site and digital access to the Countway Library, education discounts from the Office of External Education, and entry into the most comprehensive database of Harvard alumni anywhere. Learn more at alumni.hms.harvard.edu/connect.

Join Your Reunion 2020 Committee

Classes ending in "0" or "5" will be gathering for their reunions June 4-6, 2020. Join your reunion committee to help plan a customized class event and to encourage your classmates to return to campus. Contact the alumni engagement team at 617-384-8520 or hmsalum@hms.harvard.edu for more information.

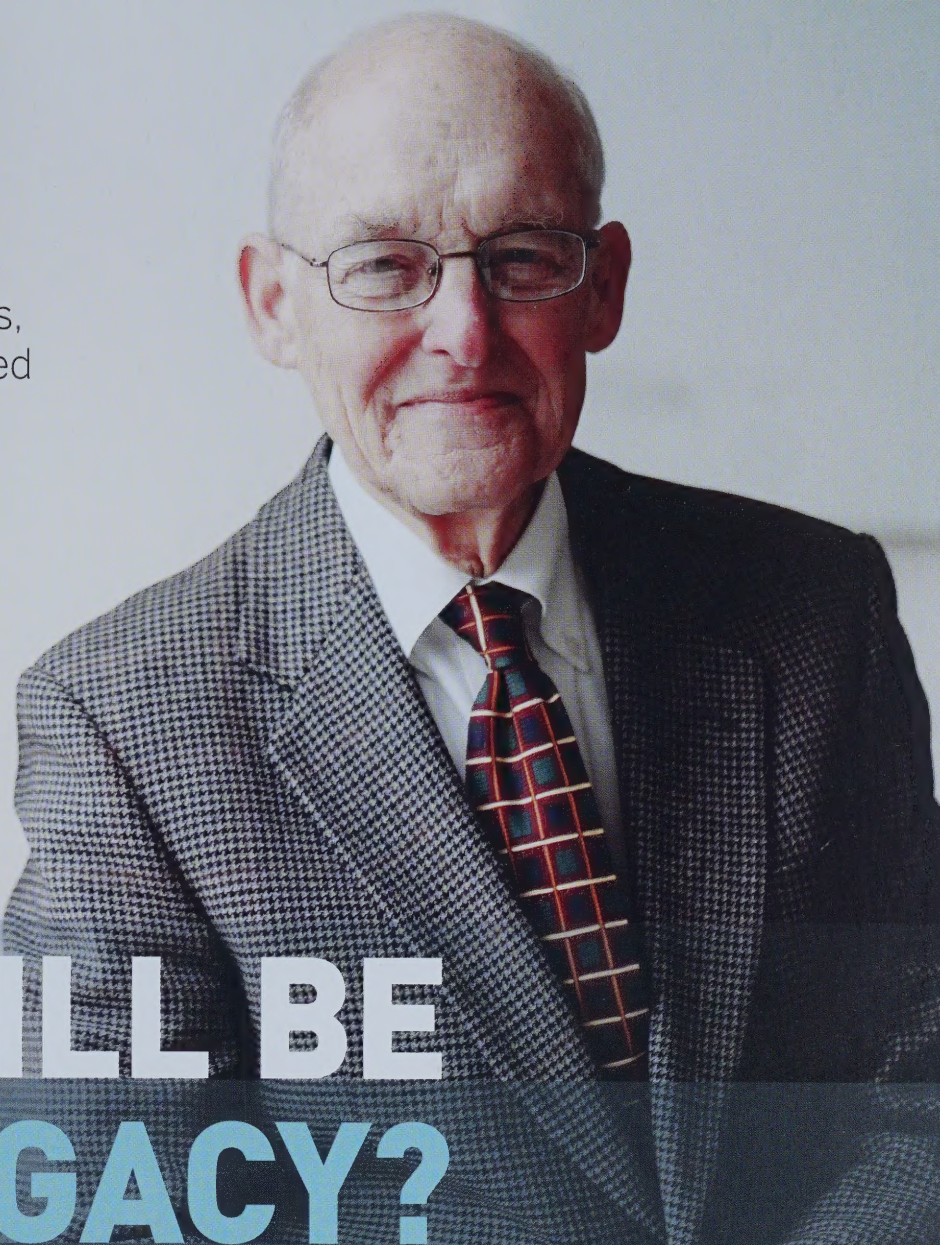


HARVARD
MEDICAL SCHOOL

"Harvard Medical School gave me the freedom to explore my interests, leading to experiences that launched my clinical and academic career. I think it's important to give back to the School in some measure what we have been fortunate enough to receive."

—Gordon Moore, AB '59,
MD '63, MPH '70

Professor of Population Medicine



WHAT WILL BE YOUR LEGACY?

Gordon Moore has worn several leadership hats over the span of his 55-year career in health care research, design, management, and education. He recently added donor to his list of titles, having named HMS as a beneficiary of his will to support the Department of Population Medicine, where he has worked the last 23 years.

**JOIN HIM IN LEAVING
A LEGACY AT HMS.**

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1-800-922-1782



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Medical Missives

Notes received from patients and appreciations delivered by colleagues are connections that can help physicians caught in the fast pace of medicine and affirm their choice of profession.